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Review:
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JUNE 1988
VOLUME 6
NUMBER 6

FAMILY & HOME OFFICE COMPUTING™

BUYER'S GUIDE TO COMPUTERS

What Your Money Will Buy

Home-Office Product Reviews

24 Software Reviews

Our Man in Moscow: USA Computers Tour the USSR

Free *Mailing Labels* Program

Remote-Host Software: How to Run Your Computer From Afar

06
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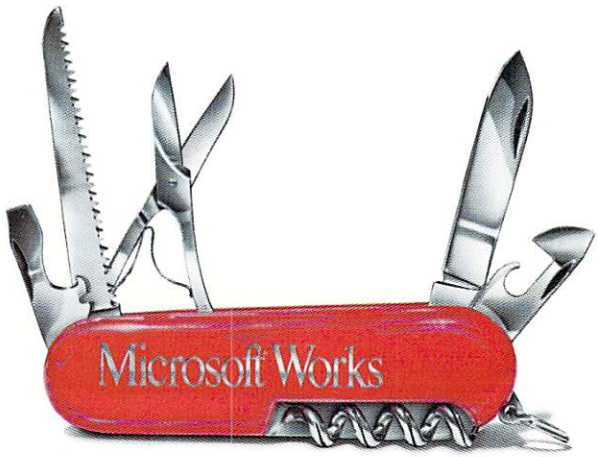

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October 27, 1987

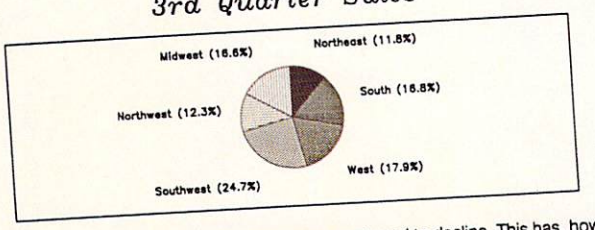
Mr. Jonathan Smith
Northwest Regional Sales Manager
Progressive Office Supplies
16011 NE 36th Way
Redmond, WA 98073

Dear Jon:

Congratulations!

Your hard work during the past few months has resulted in the most successful 3-month sales period in the history of Progressive Office Supplies. All six regions increased sales over the previous 3-month period, with the Southwest Region posting record sales of $117,282.12, representing almost 25% of our total 3rd Quarter sales.

3rd Quarter Sales



As anticipated, the sales of typewriter supplies have continued to decline. This has, however, been more than offset by the increased sales of computer supplies, as reflected in the table below:

	April	May	June	TOTALS
Copier Supplies	$27,101.22	$24,456.65	$33,140.97	$84,698.84
Computer Supplies	$36,387.26	$45,776.13	$44,600.59	$126,763.98
Typewriter Supplies	$42,735.40	$45,688.66	$40,214.73	$128,638.79
Mailroom Supplies	$45,122.10	$42,678.40	$47,603.15	$135,403.65
TOTAL SALES	**$151,345.98**	**$158,599.84**	**$165,559.44**	$475,505.26

Again, congratulations to you for such a strong 3rd Quarter. I look forward to thanking you in person at the sales meeting next month in Hawaii.

Sincerely,

Frank Addison
President

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TER SALES
ROUP, MONTH AND REGION

APRIL	MAY	JUNE	REGIONAL SUBTOTALS
$3,781.31	$3,738.00	$4,853.70	$12,373.01
$4,424.59	$3,985.05	$4,885.74	$13,295.38
$4,498.20	$4,211.85	$5,482.26	$14,192.31
6,323.99	$4,567.85	$7,834.23	$18,726.07
3,868.35	$4,049.85	$5,018.58	$12,936.78
1,204.78	$3,904.05	$5,066.46	$13,175.29
101.22	**$24,456.65**	**$33,140.97**	**$84,698.84**
15.89	$3,728.40	$2,550.20	$8,394.49
6.21	$7,173.09	$7,600.04	$20,759.34
5.80	$7,581.33	$8,527.96	$22,195.09
3.88	$12,976.29	$10,234.55	$34,487.72
.65	$7,289.73	$7,806.68	$20,330.06
83	$7,027.29	$7,881.16	$20,597.28
'6	**$45,776.13**	**$44,600.59**	$126,763.98
	$3,977.60	$4,201.95	$12,630.02
	$7,438.76	$6,242.89	$21,229.48
	$7,862.12	$7,005.11	$22,540.63
	$13,562.90	$12,878.34	$37,733.13
	$5,559.72	$3,412.63	$13,571.30
	$7,287.56	$6,473.81	$20,934.23
	$45,688.66	**$40,214.73**	**$128,638.79**
	$7,476.00	$8,359.15	$22,730.48
	$7,970.13	$8,412.56	
	$8,423.79	$9,441.67	
	7,900.56		

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INVOICE

December 15, 1987

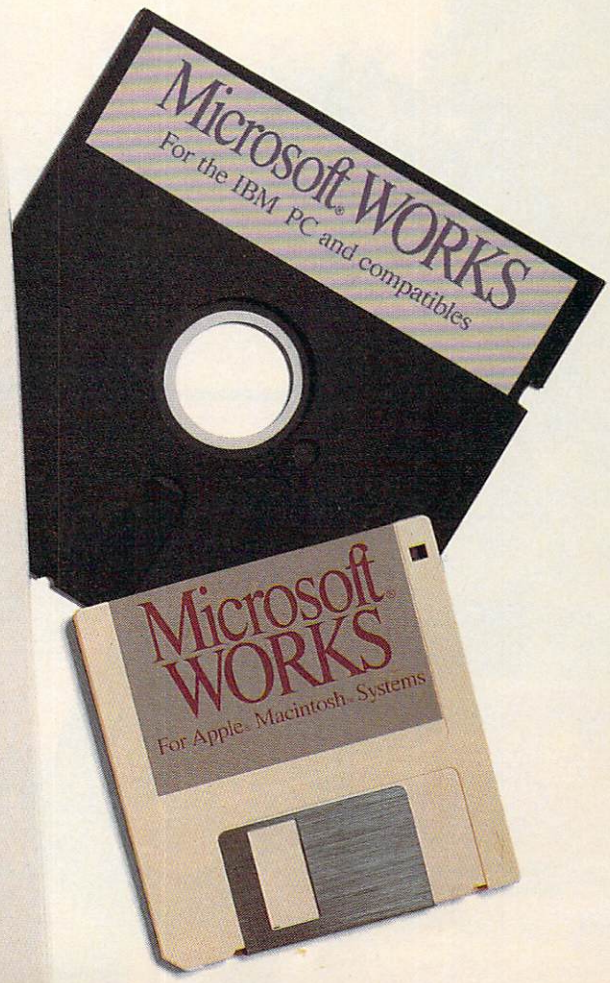
to: Fred Blaine
975 Rockside Hill
Indianapolis, IN 46238
(317) 285-3875

Software

Manufacturer:	Microsoft Corporation
Model:	Microsoft Works
Required Systems:	Apple Macintosh, Macintosh Plus, Macintosh II, IBM PC, PS/2 or Compatible

Standard accessories		Price
Word processing:	Font support	**********
	Mail merge	**********
	Mailing labels	**********
Spreadsheet:	More than 50 functions	**********
	At least 256 by 4,096 cells	**********
	At least 5 chart types	**********
Database:	Form and list views	**********
	Calculated database fields	**********
Communications:	VT 52/100 terminal emulation	**********
	Xmodem support	**********
Import/Export:	Other word processing files	**********
	Other spreadsheet files	**********
	Other database files	**********
Help:	Context-sensitive help	**********
	On-line tutorial	**********
Integration:	Multiple files open simultaneously	**********
	Dynamic chart linking	**********
	Cut/copy/paste between files	**********

List price: Easy to use,



America's best-selling mini-van.*

Your first look tells you Aerostar is a superbly versatile mini-van, with a style all its own. Its design is sleek, modern, aerodynamic. The wind works for it, not against it. With luxurious touches throughout and its special options, Ford Aerostar is America's best-selling mini-van.

New Eddie Bauer style.

This year there's a sporty Eddie Bauer model with dual front Captain's Chairs, special two-tone paint, unique interior appointments, and more. It's Aerostar with the good looks of the great outdoors!

Designed to move you.

But Aerostar's success isn't based only on distinctive looks. Its standard 3.0L V-6 has multi-port Electronic Fuel Injection for easier starting and smooth running. It delivers a spirited 145 horsepower. That's greater than any Chrysler mini-van. And it's powerful enough to tow an impressive 4900 lbs.**

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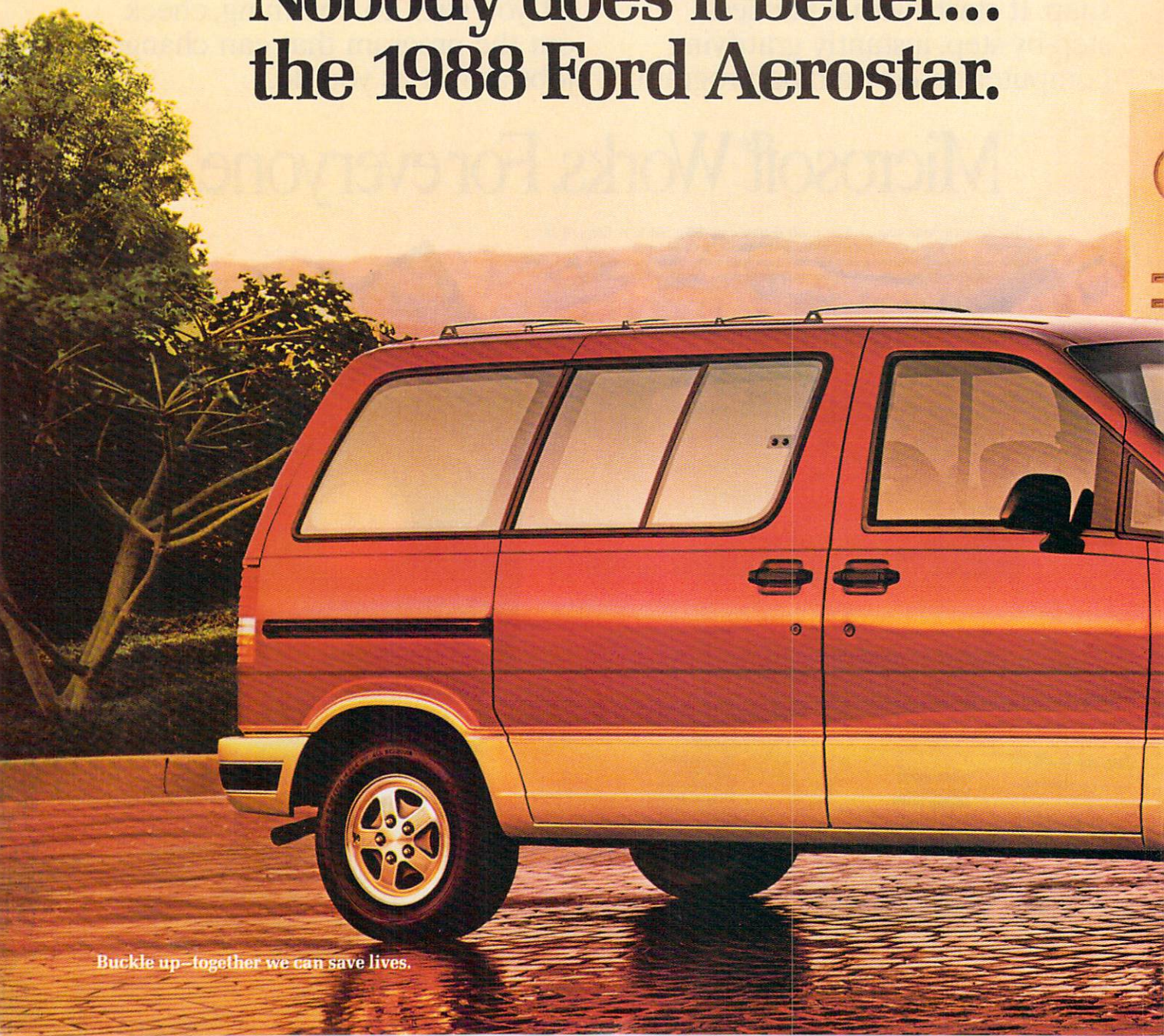
Aerostar's advanced styling gives you loads of useable space. It comfortably seats up to 7 people.† Or remove both rear seats, and create 139 cu. ft. of cargo space. You can even convert Aerostar into a sleeper with the

Nobody does it better... the 1988 Ford Aerostar.



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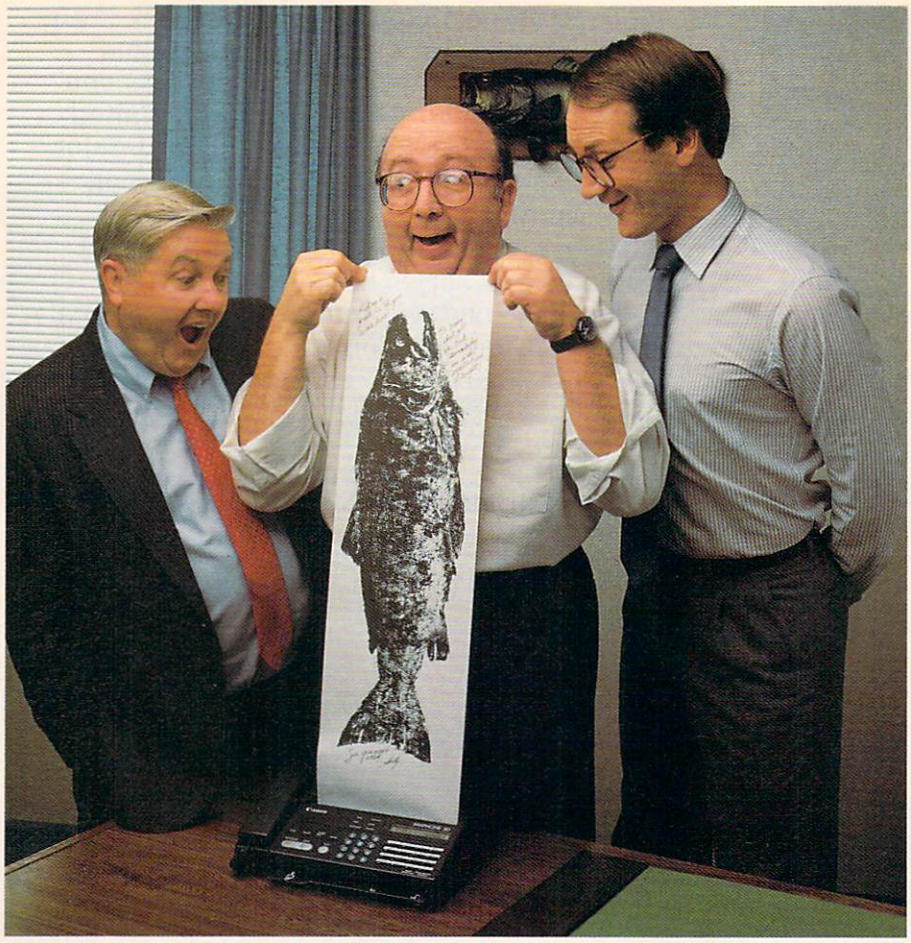
*Based on manufacturer's reported model year retail deliveries through July 31, 1987. **When properly equipped. Towing rating is reduced by passenger and cargo weight in towing vehicle. †With optional rear bench seat. Seat-bed optional on XL only.

Have you driven a Ford...lately? Ford



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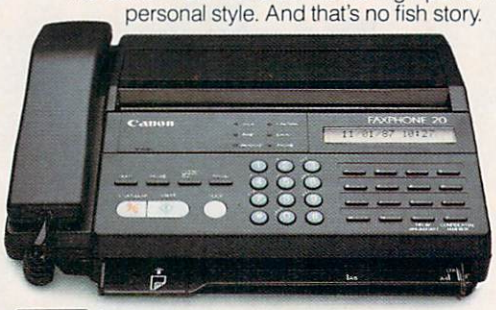

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FAXPHONE™20

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PUBLISHED BY SCHOLASTIC INC.

JUNE
1988

VOLUME 6
NUMBER 6

FAMILY & HOME OFFICE COMPUTING

COVER STORY

39 BUYER'S GUIDE TO POPULAR COMPUTERS

Take the confusion out of computer shopping. Our guide to 45 systems includes specifications and prices for models from Apple, Atari, Commodore, IBM, and Leading Edge, Tandy, and other IBM-compatible manufacturers.

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Put the files and programs on your home or office computer at your fingertips—wherever you roam.

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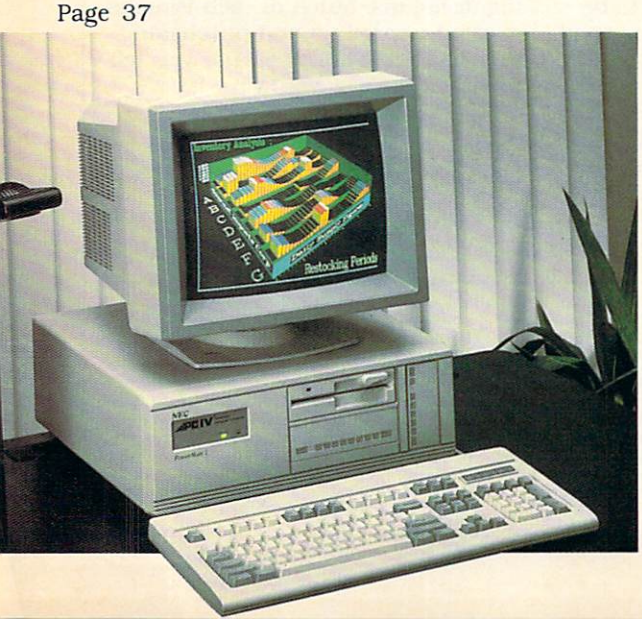

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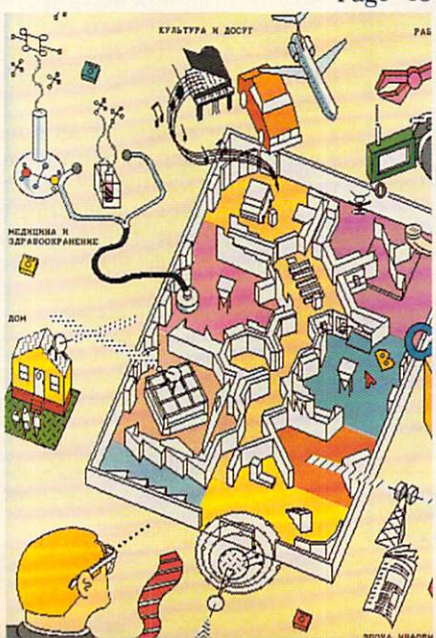

FAMILY & HOME-OFFICE COMPUTING (ISSN 0738-6079) is published monthly by Scholastic Inc., 730 Broadway, New York, NY 10003. Subscriptions: in U.S., 12 issues for $19.97; Canadian and U.S. possessions add $6.00 per year for postage; Foreign residents add $8.00 per year. Printed in U.S.A. Copyright © 1988 by Scholastic Inc. All rights reserved.

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FC-6/88

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- 2 **INFO 2a,b**—(2 disks) Zip-Phone, national areacode/prefix to zip-code cross reference.
- 2 **LANGUAGE 3a,b**—(2 disks) The A86 3.09 macro assembler and debugger for 8088/86/286s.
- 2 **SHELL 4a,b**—(2 disks) Automenu and HDM II 4.04 hard disk prog. for custom full-screen menus.
- ☐ **UTILITIES 5**—Hard disk utilities for verifying, formatting, parking and optimizing your disk drives.
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CIRCLE READER SERVICE 20

EDITOR'S NOTE

IN SEARCH OF VALUE

Nearly everyone says the same thing: "To people who run a small or home-based business, value is the most important consideration in making a buying decision."

On March 11, we held a Home-Office Forum to which we invited leaders with expertise in working from home and running home-based businesses. They emphasized that for many people who work from home, computers and home-office equipment are the mainstay of their livelihood. First of all, it is important that they feel confident in the quality of the equipment on which they are so dependent. Another major concern is that if and when something goes wrong, service is readily available. Often that means buying a reliable brand and knowing where and how to get immediate service.

But to me value says something else. It's personal, based on each of our perceptions and needs. In contrast, cost is impersonal, general, unrelated to what you or I may need, and therefore an unreliable factor upon which to make a purchasing decision. This is true of any commodity, but as the price and need increase, the importance of value goes up and the importance of price alone goes down.

Throughout the five-year history of our magazine we have heard from distressed owners of supposed bargain machines, often discontinued models that had limited or no growth or upgrade potential, no steady stream of software available. We continue to warn readers to beware of bargains that seem too good to be true. Usually that's just what they are.

Another reality we all have to deal with, however, is what we can afford. And that means that cost remains a factor in determining the value quotient. But don't look to buy based on price tag alone. Remember to take the time and care to make buying a computer a personal choice.

This month's "Buyer's Guide to Computers" (page 39) was designed to give you a broad view of choices, based on price and category. We use this occasion to avoid assumptions about the kind of computer you might want to buy and bring you a range of options and prices.

Throughout the year we run a variety of buyer's guides, some based on specific operating systems; others are devoted to a single peripheral or add-on, such as a laser printer or monitor or various boards; some cover fax phones or personal copiers or other categories of home-office equipment. All are meant to help you make informed buying decisions.

We provide buying help in numerous ways: through clear and concise explanations of what to look for in an item you're considering; through charts that enable you to compare various options; and through articles in question-and-answer format that raise important issues in making decisions. Much of each issue is devoted to product and purchasing information. That's because you tell us that's the way you want it.

Claudia Cohl

CLAUDIA COHL
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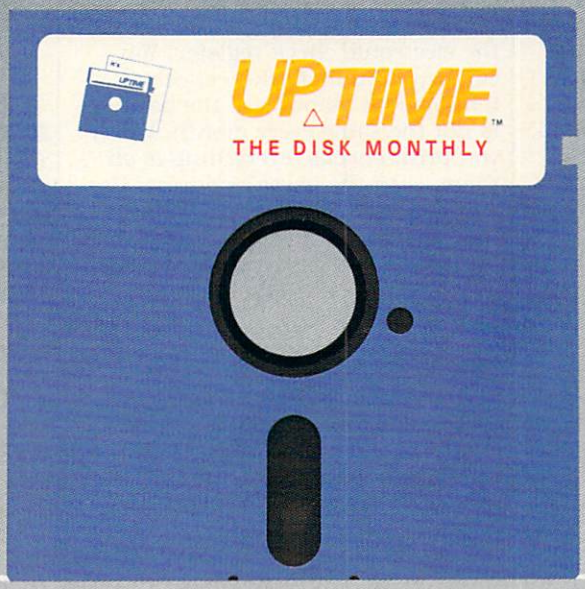

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CIRCLE READER SERVICE 36

FA068

LETTERS

WEIRD PROCESSING?

In his March article on word processing, Rob Krumm ignored the fact that centering, boldfacing and underlining, if not part of the original inputting, require a tedious ‹BLOCK› operation in *WordPerfect 4.2*. Why he thinks it is easier to insert tags such as @QUOTE@ and replace them with formatting later, I don't know.

JOHN EARLE HEDRICK
Mesquite, Texas

Since I am an instructor in software applications, I was enthralled with Rob Krumm's article, "Timesaving Techniques for Word Processing," in your March issue. Of particular interest was his recommendation to divide the typing task into smaller jobs: entering, editing, and formatting. This becomes especially important when the temptation to apply color and graphics interferes with the ease and speed of application in a program such as Microsoft *Excel*.

DIANE GOUGH
Stamford, Connecticut

25 IS GREATER THAN 30

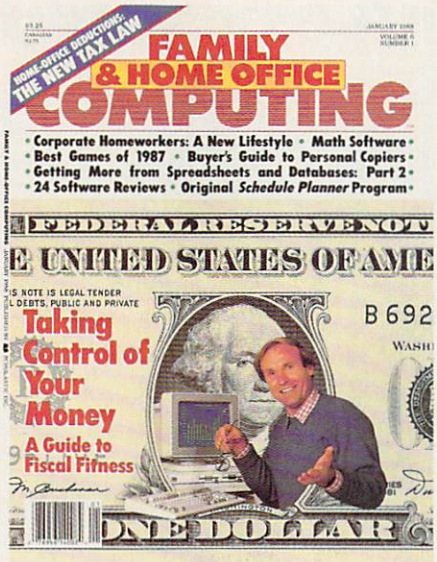
Apparently the IBM Model 25's outstanding value, compared to the Model 30's, was not obvious to Henry Beechhold when he mentioned the Model 25 (Machine Specifics; December 1987).

With the Model 25, you can have 640K, an Enhanced PC keyboard, a 20MB hard disk, and an internal Radio Shack clock/calendar for $550 less than a similarly equipped Model 30. That's like getting your printer and DOS 3.3 free with your Model 25! The trade-off is a marginally less sharp display and two less expansion slots. For occasional business, home, recreational, and educational use, it's surely worth considering if you're looking at the PS/2 line.

JOHN B. COWN
Ridgefield, Connecticut

THE PLOT *QUICKENS*

One thing you forgot to mention in your January cover story is that Version 2 of *Quicken* (Intuit) allows you to save groups of transactions. In the blink of an eye, all payments in



the group are recorded on checks, and the information is transferred to the electronic check register. You can scroll from check to check to enter payment amounts if the payment is not the same every month. When you print checks, everything is on them, even the payee's address. Use window envelopes, and you won't have to address them or make labels.

JAMES B. THOMPSON
Barstow, California

THE TIME IS RIGHT

For a number of years I have learned and profited from your magazine. Now, I note with interest the shift in orientation to home business, which appears to be timely and appropriate.

CHARLES R. GOERTH
ATTORNEY-AT-LAW
Wilmette, Illinois

What sets your magazine apart from the other seven computer publications I read are the articles about individual computer owners. I like knowing how they became interested in computers, how they learned to use them, and what they are accomplishing.

B. BOWMAN
Milwaukee, Wisconsin

WHO'S GOT THE RIGHTS?

Are the programs in your magazine in the public domain?

MATT EVELSIZER
Cuyahoga Falls, Ohio

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TAX HELP

I've been operating a home-based business for several years, and Pasquale Cirullo's and Michael Zaplitny's great *Home-Office Deduction Worksheet* program (February) will be *very* helpful to me this tax year!

QUINTON MITCHELL
Jackson, Tennessee

GIVE VENDEX A FAIR SHAKE

I felt your review (Product Reviews, December 1987; page 72) of the Vendex HeadStart Turbo 888-XT, a system I just bought, did not do justice to the system or to its market position.

I do agree that the tutorial is less than great, but the rest of the included software is good for a beginner. I bought the system mainly for the DOS shell; in fact, I hadn't even considered buying an MS-DOS system until I learned about shell menus in FAMILY & HOME-OFFICE COMPUTING. We also found the documentation useful in solving some of the problems your reviewer mentioned.

JOHN A. DEVORE
Pennellville, New York

OVERSIGHT

Citibank's toll-free Direct Access number was inadvertently omitted from the listing of banks offering electronic banking services (Personal Finance, February; page 16). The number is (800) 248-4472, ext. 9015.

FAMILY & HOME-OFFICE COMPUTING *looks forward to letters from readers. Please direct your correspondence to Letters to the Editor,* FAMILY & HOME-OFFICE COMPUTING, *730 Broadway, New York, NY 10003. Include your name, address, and telephone number. We reserve the right to edit letters for length and clarity.*

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Softdisk rating: "■■■■" . . . . . INCIDER, APR. 1987

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BIG BLUE DISK (IBM PC version) Contents of Issue #17

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CIRCLE READER SERVICE 18

HOME-OFFICE SHOPTALK

AN EXPERT'S ADVICE ON STARTING, RUNNING, AND EXPANDING A HOME-BASED BUSINESS

BY JOANNE H. PRATT

Q. I am a telemarketing representative for a manufacturing firm. My husband is being transferred, and we will soon move to another city. My employer would like me to keep my sales territory and operate a home-based office. I will need a word processor, database, and spreadsheet. I want a program that can reschedule customer callbacks, write form letters, and figure price quotes on a Mac Plus. I also want a program that dials the phone and records the length of my calls. What software do you recommend?

SARAH F. ROWLEY
Gatesville, Texas

A. Bravo to your enlightened employer! A good telemarketing software choice is the powerful *C.A.T.* program from Chang Labs (5300 Stevens Creek Blvd., Suite 320, San Jose, CA 95129; [408] 246-8020; $395). This full-fledged relational database is designed for Mac people like yourself who need to keep track of contacts, activities, and time. Version 2 of *C.A.T.* includes all the sales features you need. In addition, it automatically posts each of your entries and allows you to quickly track each of your interactions in multiple windows on-screen.

You may not need a separate spreadsheet and word processor, but if you do, Microsoft *Excel* ($395) is an outstanding spreadsheet with database functions. Microsoft *Word* ($395) will perform every feat you need for word processing, and more.

JOANNE H. PRATT, *president of Joanne H. Pratt Associates, Dallas, Texas, has 28 years of experience in operating home-based businesses. Her business conducts research and consults for private and government clients.*

Q. I am in charge of a medical/surgical ward, which is staffed by 12 individuals who must provide 24-hour coverage with a minimum of two individuals per shift. Is there a program that covers work schedules?

HERMON L. SANTA ANA
Biloxi, Mississippi

A: *R Office Manager* (R Systems, 10310 Markison Road, Dallas, TX 75238; [214] 343-9188) was developed for the army, so it may offer more control than you need. The PC version ($195) will let you schedule your surgical team on a daily, monthly, or yearly basis. Individuals can keep personal schedules, and the calendar will highlight conflicts. The software includes note pad, calculator, and phone-book features that will help you organize your desk.

A low-cost alternative, if you have the time and a spreadsheet program, is to set up your own scheduling template. *(Refer to "Getting More from Spreadsheets and Databases," in the January issue, for a description of a nursing administrator's spreadsheet model for scheduling her staff.)*

Q. My friend and I are planning to start our own typing/word-processing service from one of our homes. Unfortunately, neither of us knows where to begin. Any suggestions?

DIANE OSTLUND and ROBIN EPPS
Brooklyn, New York

A. Equipment can be leased, but prices have dropped so far that leasing is no longer cost-effective. Because most businesses use MS-DOS machines, you will do best with an IBM XT, AT, or clone, a laser printer, and *WordPerfect* or Microsoft *Word* software.

Try "temping" for a few months. You'll learn professional standards for corporate clients, and, if you earn $18 an hour as my daughter does in New York City, you'll soon pay for your equipment. But before you plunge in, research your market and write your business plan. Check the ads in the *Village Voice* for local pricing. Canvass the businesses in your neighborhood. Before you invest in a new business, be sure that your services are needed. *(See "How to Start A Word-Processing Business" in the November 1987 issue.)*

Q. I have a service for cleaning homes and offices. My problem is attracting more business. I have tried mailings and fliers. Do you have any ideas?

JACQUELINE TAYLOR
Chicago, Illinois

A: Mailings and fliers sell cleaning, not the cleaner. You need to market a neat, clean, and dependable *person*, someone clients can trust to leave behind a sparkling home *and* all of the silver.

Build your business on satisfied customers. Ask for referrals from your clients. You may want to offer a bonus—perhaps clean a few windows—for each new client that old customers bring to you. Also, become acquainted with the leasing agents and building managers of the offices your employees now clean and request referrals.

Valerie Bohigian's *How to Make Your Home-Based Business Grow* (Signet, 1986; $3.95) can help you determine whether you have overlooked any factors such as presentation, pricing, or even your own commitment to your business. Many of her tips apply to services as well as products.

SEND US YOUR HOME-OFFICE QUESTIONS!

Let Joanne Pratt be your home-office consultant. Send your questions about telecommuting, working for a corporation from home, or running a home-based business to: Home-Office ShopTalk, FAMILY & HOME-OFFICE COMPUTING, 730 Broadway, New York, NY 10003. Unfortunately, we will not be able to acknowledge each submission. ■

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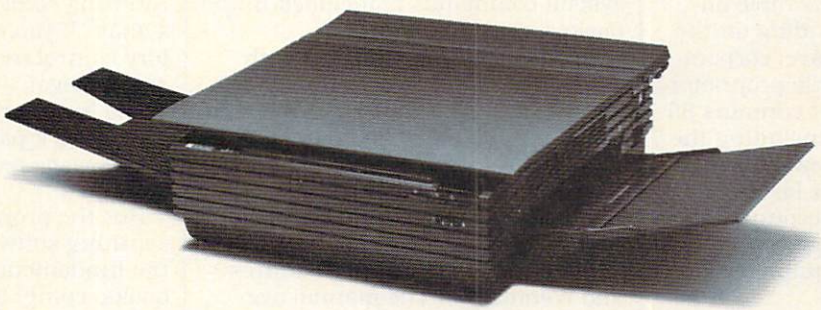

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CIRCLE READER SERVICE 22

FINANCE

SOFTWARE FOR SMALL-BUSINESS BOOKKEEPING

Save Time and Money with *InfoTeam Turbo Accounting*

BY WENDY COLE

If you run a small business and are tired of spending hours each week keeping books the old-fashioned way, it's probably time to enlist your computer as your bookkeeper. *InfoTeam Turbo Accounting* (Info Designs; [313] 334-9790), a program intended specifically for small operations, may be just the program you need to become automated. The system is flexible, easy to use, well-documented, and affordable.

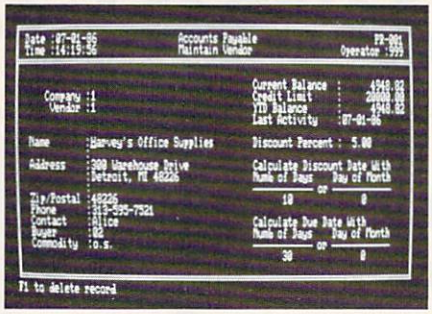
This $99 accounting software is easy to learn even if you've never set up an accounting program. A scaled-down version of Info Designs's successful $495 *InfoTeam Accountant*, *Turbo Accounting* is a fully integrated system that includes modules for a general ledger, accounts payable, accounts receivable, invoices, and checks. Info Designs was smart to realize that there are many computer users around who run businesses, but who are reluctant to or can't afford to plunk down the $1,000 or more that it often costs to acquire the full range of accounting functions.

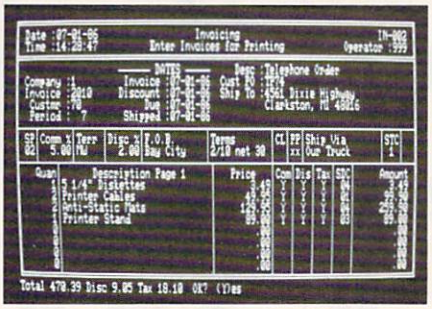
Turbo Accounting's chart of accounts can be loaded automatically by following a series of simple on-screen directions depending on the type of business you have: corporation, partnership, or sole proprietorship. The built-in chart contains 85 account descriptions, including the standard payables, receivables, and current year's profits or losses, as well as more obscure accounts, such as janitorial or cleaning services, freight charges, and equipment rental.

And you don't have to rely on the standard chart provided by *Turbo Accounting*. The system also allows you to modify the chart or design one specifically to meet your company's needs.

ACCOUNTING MADE EASY

The system relies on simple two-letter mnemonic commands to carry out accounting functions. In most cases, the commands are logically labeled, such as EI for Enter Invoices and MV for Maintain Vendor. A separate reference guide listing all the system commands is included in the package.





Here are two screen shots of *InfoTeam Turbo Accounting* (available for IBM PCs and compatibles). The top screen is taken from the Accounts Payable module, and the bottom screen is from the Invoicing module.

Once you become familiar with *Turbo Accounting*'s range of commands, they're simple to use. But in the event you make an error or need more detailed information about a function or command, help is easily available by pressing the F10 key. An operator's manual describes in detail all of the program's features and commands. The manual also provides samples of the print reports available through the system, including audit reports and cash-receipt records.

Another handy feature of the system is its unique security mechanism. This allows a manager to offer an employee access to the system on a "need-to-know" basis. For instance, you might want specific workers to be able to call up the customer and vendor lists only for inquiry and not be able to alter them. The system allows you to set up six different operator codes, each with a password. A caveat: Don't forget your operator code or password, or you'll have to get another through Info Designs's customer support department in Bloomfield Hills, Michigan.

LESS FOR YOUR MONEY?

Unlike the earlier version—which allowed users to maintain records for more than 1,000 companies or until disk space ran out—*Turbo Accounting* is designed specifically to handle the books for a single company with only one branch or department. In addition, there are limits on the number of accounts that can be recorded. The *Turbo* system can accommodate a maximum of 750 accounts, including general ledger, accounts payable, and accounts receivable. And no more than 600 transactions in total can be conducted per period (usually per month). But these limits should not affect most small businesses. One missing feature, however, which could pose a bigger problem, is the inability of the scaled-down version to calculate finance charges.

If you're concerned that you may outgrow the basic system, the company's full range of advanced accounting software makes upgrading a snap. If you're interested in inventory control (not included in the basic package), a separate module called inventory/order entry is available, as is a payroll module that tracks wage records. (Modules cost $100.)

But the program, like most accounting software, won't teach you the fundamentals of accounting or bookkeeping. If you've had problems with record keeping manually, it is best to sort your files with help from a professional before purchasing *Turbo Accounting*.

The job of the software is to help a good manual system perform much faster and more efficiently. And there's no doubt that for many small-business operators, *Turbo Accounting* is a great buy and is sure to fit (and print) the bill. ■

WENDY COLE, *a reporter/researcher for* Time *magazine, reviews software for* FAMILY & HOME-OFFICE COMPUTING.

EDITOR'S NOTE: *For an overview of accounting software and a listing of other packages, see the February issue of* FAMILY & HOME-OFFICE COMPUTING.

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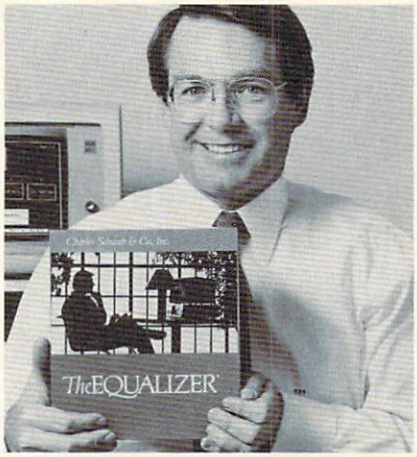

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TELECOMPUTING

REMOTE CONTROL: Doctors, Consultants, and Salespeople Can Access Their Home or Office Computers From Remote Locations

BY ERNEST PEREZ

It never fails. Somehow you always need or want to use a personal computer that's somewhere else!

Repeatedly you'll find that you really want to run some program or copy some file on *your* computer, and it's not where you are. Or, the reverse. You're at your home or office, and you absolutely, positively have to get to something on a coworker's computer. You need information right away or want to help the other person with some problem.

Well, wise old Ma Bell came up with the perfect answer years ago when she counseled us to "Let your fingers do the walking."

With a telephone–modem connection and "remote-host software"—which includes a calling program and a host program—you can dial up a microcomputer at a remote location and use it just as if you were sitting at its keyboard. The answering computer becomes a "host" computer, allowing the remote caller to run programs and perform system work on the host machine.

A PRACTICAL TOOL

What kind of practical advantages can remote-host software provide? First of all, there is the sheer convenience of remote access to your own computer. Nothing beats being able to dial in for a quick spreadsheet recalculation, copy an obscure file you forgot to bring along, check that draft report, or look up the exact numbers in a database file. After all, this is the computer age!

For instance, Dr. Marc Hamburg, of Smithtown, New York, uses remote-host software to dial into his computer in one of his two home offices. "Best of all," he says, "now I have dial-in access to my office file of patient records—from home, hospital, or any other location."

Dr. Hamburg's office manager routinely uses *PC Anywhere* software *(see "Popular Remote-Host Software")* to link the computers in both offices. His office manager dials into the computer at the other office to update patient records, copy files, and even print reports or bills.

Dr. Hamburg says, "With *PC Anywhere*, you can even print a report originating from the *remote* computer on your *local* printer. So, you don't even have to worry about being at the right office."

In addition, Dr. Hamburg enjoys modifying his office system and is constantly "tweaking" it to get just a bit more performance or efficiency. "But my staff pushes me off the office machine during the day," he says. "So, in the late evening, I dial into the office AST/286 from home and take care of system modifications. I can make major system and menu changes. Sometimes, my staff is pretty surprised in the morning when they find what I've done during the night!" A password option lets users protect their files from vandals.

The only real negative or practical limitation to remote access is modem transmission speed. A Lotus *1-2-3* or word-processor display flashes up on your local computer and gives you the high-speed personal computer screen updates to which you're accustomed. The 1200-baud display speeds for remote transmission of that same screen display crawl along in comparison. Experienced remote users recommend using 2400-baud or 9600-baud modems for heavy remote access use. The 9600-baud speed is nearly identical to what you're used to seeing on your local computer screen.

SAVE ON HARDWARE COSTS

"Hardware economy" is a not-so-obvious feature of remote-host software. Let's say you have a top-of-the-line, powerful computer at the office. It's an IBM PS/2 Model 50, 60, or 80 with an attached laser printer. Put remote-host software on that machine, and you can use all that horsepower, from home, from a branch office, or from the road. All you need is an MS-DOS compatible and a modem. You can use bare-bones equipment from any location and still have all the advantages of the larger machine. The software supports CGA if both computers are graphics equipped and will even translate color attributes to a monochrome monitor in text mode.

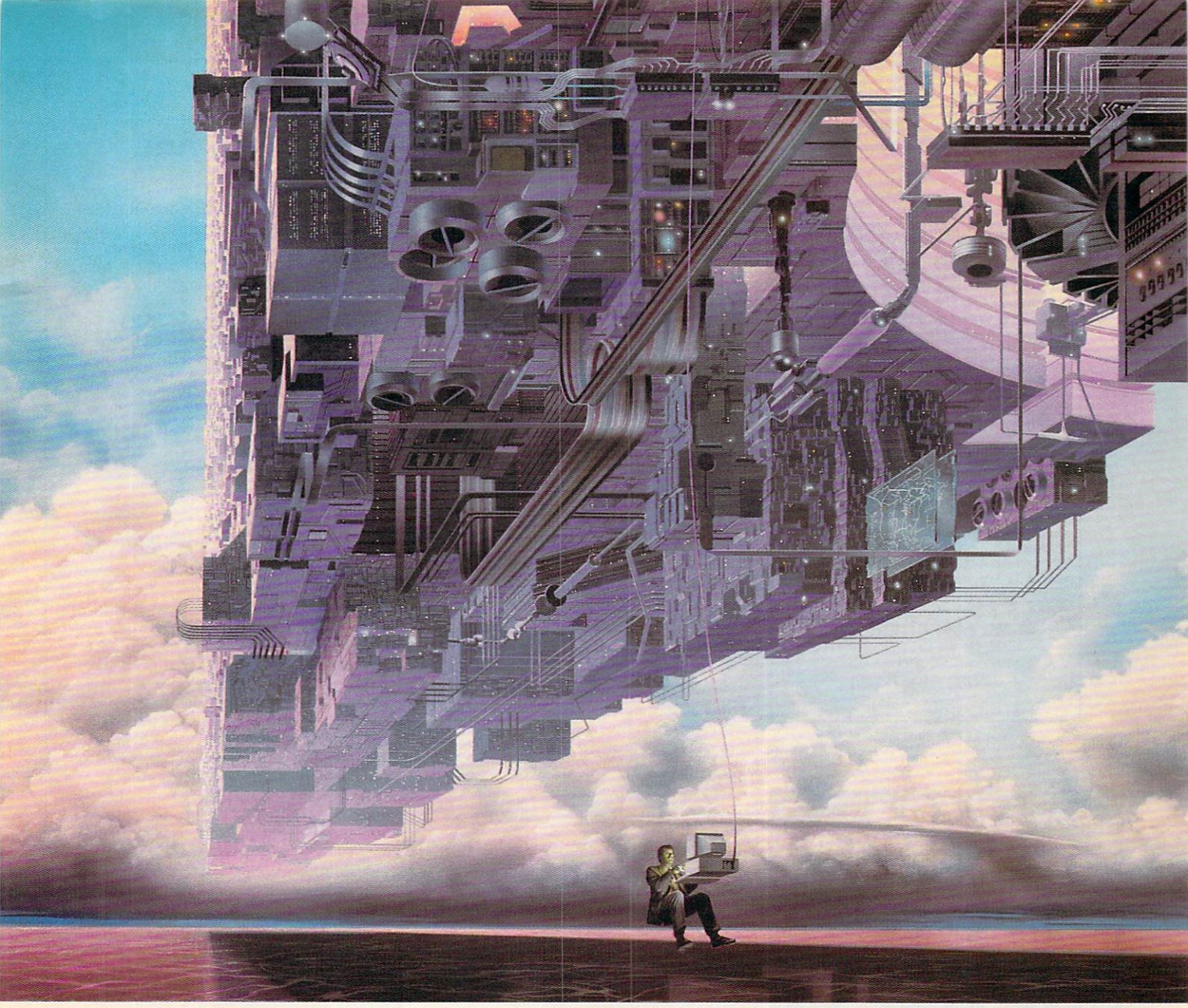
"Conferencing," or long-distance collaboration, is another possibility. Linked computers simultaneously run the same program and display identical screens. It's almost as if you were sitting beside the person at the other keyboard. With a word processor, for instance, both of you can simultaneously work on the same draft report, contract, or other document. You can talk about changes on a separate voice telephone line. And, if you don't have another phone line, you can use the "chat window" in many remote-host programs to type comments or suggestions back and forth. You can do the same type of collaborating using a spreadsheet or database program or some other kind of software.

Remote collaboration lets you complete a long-distance business project in a fraction of the usual time. Imagine: no mimeographs of drafts, no mail delays or messenger expenses, no lengthy telephone conferences, and no barely legible notes. Instead, work gets done just as if you and your partner were talking it over while sitting at the same keyboard. It's easy to justify long-distance telephone expenses for the gain in productivity.

With remote-host software, you can also offer (and maybe charge for) valuable remote support service—to your customers, clients, and colleagues. After you've installed the host software on their machines,

ERNEST PEREZ, *who helped computerize the library at the* Chicago Sun Times, *now works in the newspaper's circulation department.*

ILLUSTRATION BY KENNETH SPENGLER



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TELECOMPUTING

POPULAR REMOTE-HOST SOFTWARE

To use remote-host software, you need two programs: a host program and a calling program. (Unless otherwise noted, it's best to use programs from the same company.)

Carbon Copy Plus, Version 4.0
Meridian Technology, Inc.
7 Corporate Park, Suite 100
Irvine, CA 92714
(714) 261-1199
MS-DOS compatible
$195 per program (two required)

Primarily designed for support applications, good for collaboration use. Fast file transfer.

Close-Up, Version 1.10
Norton-Lambert Corp.
P.O. Box 4085
Santa Barbara, CA 93140
(805) 964-6767
MS-DOS compatible
$195 for Customer (host) program; $245 for Support (calling) program

Support applications emphasis, good for collaborations. Simple installation, one program for each computer. Uses *1-2-3*-style menus. Runs as memory-resident program on host machine while you use other programs.

Line Plus Master, Version 2.10
Concept Development Systems
2778 Hargrove Road, Suite 349
Vinings, GA 30080
(404) 434-4813
MS-DOS compatible
$200 for host and caller programs; $100 for additional remote computers, with program called *Line Plus Remote*

Powerful, easy-to-use remote-host software. Near-automatic installation. Also works as standard communications software, with automatic recording of telephone dialing and log-on sequences. Includes Line Expert, an Artificial Intelligence "expert system" that advises you on telecommunications technicalities and configuration of modems, hardware, and cables.

PC Anywhere, Version 2.10
Distributed by EKD Computer Sales and Supplies Corp.
764 Middle Country Road
Selden, NY 11784
(516) 736-0500
MS-DOS compatible
$99 for both host and caller programs

A "best buy" in my book, this powerful, high-performance package comes at a bargain price. One of the best-performing remote-host packages for screen-display speeds, file transfers, and similar activities. With very sophisticated host options, *PC Anywhere* can be used with many standard communications programs (not only the vendor's own caller software). Includes individual log-ons and passwords and automatic start-up programs and tailored menu choices. An updated version, *PC Anywhere III* ($145), adds automatic callback, voice-data switching, and other enhancements. *PC MacTerm* (distributed by EKD Computer Sales and Supplies Corp., $99) allows a Macintosh user to access any PC-compatible computer running *PC Anywhere*.

you can dial up their computers to work on system or software problems and be a silent observer whenever these contacts have problems. Then, you can debug or reconfigure their systems as needed.

A remote-host program is also a good training aid. With the chat mode, or a separate voice line, you can coach and walk novices through correct operating methods. You can "look" over their shoulders and take care of problems in just a few minutes—from anywhere! Think of the resulting happy customers and inevitable goodwill. Think of the savings in telephone expenses, delays, travel time, and other general hassles.

GETTING STARTED

Remote-host software is not much more complicated than normal communications software. But, you really should familiarize yourself with standard communications programs to get past the "required course" level.

Decide how you'll use remote-host software. Then, contact vendors or publishers carrying the packages that interest you. Ask for complete product-information packages, including published reviews of their software.

When you arrive at the final evaluation stage, you'll find it worthwhile to spend a few bucks on long-distance calls to the publishers whose products you prefer. Talk with one of the publisher's technical-support representatives (be sure to get names), and inform that person of your plans for using the software. Verify that the software will work with your computer, modem, and other major software packages you want to use. You'll receive lots of free advice; the representatives want to make the sale. Ask for return privileges in case of system compatibility problems. This small investment in initial telephone contact and preliminary support information will really pay off for you. ■

MACHINE SPECIFICS

NEWS, OPINIONS, QUOTES, AND RUMORS ABOUT YOUR FAVORITE COMPUTER

APPLE

BY CHARLES H. GAJEWAY

MACINTOSH

With Claris—the Apple spin-off software company that is run as an independent—offering substantially improved versions of *MacPaint*, *MacDraw*, and *MacProject* and Letraset's amazing *Image Studio*, it's clear that Mac graphics performance is being pushed to the max.

Beautiful Mac II. On the hardware side, the Macintosh II is attracting great interest from developers. High-performance monitors and big, fast, hard disks are coming from a variety of developers.

Despite the new machine's somewhat forbidding price tag, I can understand all the Mac II hoopla because I have been using one steadily awhile. The speed, power, sound, and big color display are addictive. The amazing screen response and computational speed make even the most complex tasks seem nearly effortless; the promise of the Mac technology and operating system is realized more fully than ever.

Mac II Software? While a popular topic of speculation is when the first Mac II-specific program will appear, I hope that it never does. I would prefer that future Macintosh software be written in a fashion that will "hide" II-specific features on the Plus and SE, protecting Plus and SE owners from obsolescence for as long as possible, while giving II owners a little something extra for their investment.

Suitcase Software. This month's software special is *Suitcase* (Software Supply; $60). This nifty program installs in your system folder and allows unlimited access to desk accessories and font files from practically any program. This enables you to keep your system file to a minimum size, yet have all your favorite desk accessories and fonts just a few clicks away.

As a bonus, you get *Pyro!*, which prevents burn in and displays a random fireworks simulation on your darkened screen after a preset idle period. The *Suitcase* combination—which includes *Pyro!*—is one of the more attractive utilities I have run across lately. *(See review in this issue's Software Guide.)*

APPLE II

Apple software that runs on an IBM? Yes! *AppleShare PC* (Apple; $149) allows MS-DOS systems equipped with an AppleTalk adapter card to share both data and application programs with Apple computers on the network.

Until recently, the AppleTalk Network System only supported Macintosh, MS-DOS, and Digital's VAX computers. Now, enhanced Apple IIe's and IIGS's can be part of the system. Schools should take advantage of the network to integrate Macintoshes with their army of IIs.

Apple GEOS. Berkeley Softworks is preparing a version of GEOS for the Apple II. GEOS is the popular mouse-driven operating system now available only for the Commodore 64 and 128. A demo I saw ran smoothly on the IIe, IIc, and IIGS. More on Apple GEOS ($130) when I see the final product.

SCSI Hard Drives. Despite what I said last month about high-capacity floppy drives, there is nothing like a hard drive for speed and convenience. And while the Sider (First Class Peripherals) was—and still is—a good hard drive, Apple's new SCSI interface ($129, plus the cost of cables) has a lot of advantages. The introduction of this fast, flexible interface—which is built into Macintosh computers—means that Apple II owners can now connect up to six devices (hard-disk drives and tape backups, for instance) to only one slot in their computers!

Although six units is overkill, I think that an Apple IIe with a hard disk (and maybe even a CD-ROM drive) connected to a SCSI port would be a potent, reasonably-priced information system.

I am very excited about this product. A mass-storage standard for the Apple II has been conspicuously absent for too long, and having it means that the Apple II can remain a viable professional-level machine for a long time.

CHARLES H. GAJEWAY *can be reached on CompuServe* (ID: 73357,3577) *or on GEnie* (ID: C GAJEWAY).

ATARI

BY MATTHEW STERN

I got my first glance at *Microsoft Write* for the Atari ST, in 1986, at the Southern California Atari Fair. The preliminary copy I saw had most of the editing functions, but no multiple fonts and printing capabilities. At that time, Atari assured me that this program would be finished "soon." Two years later, *Microsoft Write* ($195) has finally arrived on dealers' shelves. Is it worth the wait?

Write's ability to display and print multiple fonts will undoubtedly be its biggest selling point. GDOS fonts come in different point sizes and attributes, including bold, italic, and underline. What you see on the screen is indeed what is printed. If you have any experience with such programs as *Easy Draw* and *Dollars and Sense*, you know GDOS's exceptional print quality on dot-matrix printers.

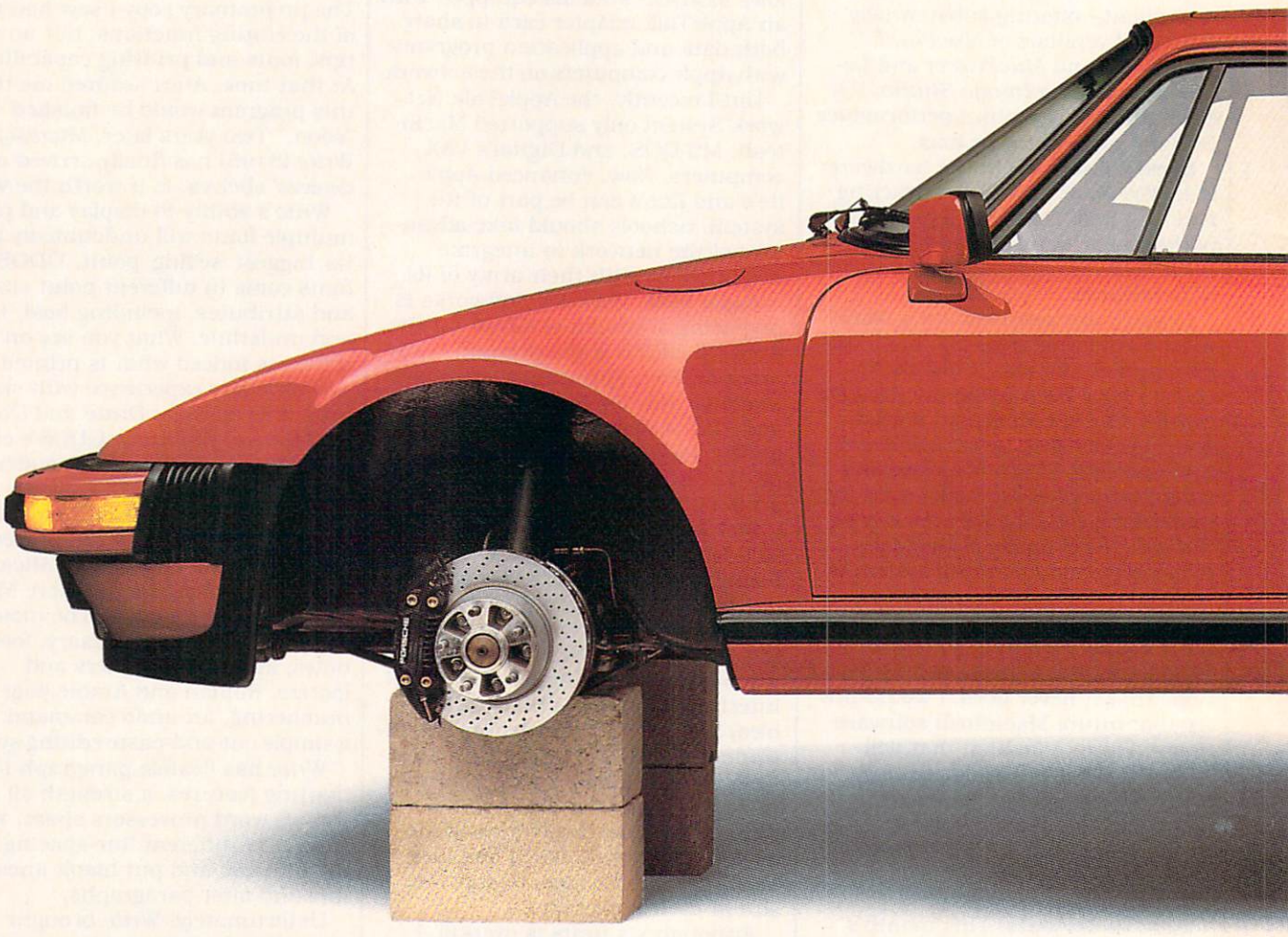
Microsoft Write. I was equally impressed with *Write's* word-processing features. *Write* is based on *Microsoft Word 1.03*, once the premiere Macintosh word processor. The most notable features are a glossary, footnotes, automatic headers and footers, Roman and Arabic page numbering, an undo command, and a simple cut-and-paste editing system.

Write has flexible paragraph formatting features, a strength all Microsoft word processors share. You can select different line spacing, create indents, and put blank lines before and after paragraphs.

Unfortunately, *Write* brought along *Word 1.03*'s quirks as well as its strengths. *Write*, for example, does not have automatic pagination. To determine your page breaks, you must select the Paginate command from the Document menu. *Write* doesn't come with a spelling checker, but such programs as *Thunder!* (Electronic Arts; $50) will serve well.

WordPerfect. *WordPerfect*, the top-of-the-line ST word processor, has added some needed enhancements. With the January 29 update, *WordPerfect* has added a new conversion program to change *1st Word*, *Word Writer*, and *ST Writer* documents

Some Apple II owners still



It's like listening to Beethoven's 9th on a transistor radio. Or watching the Super Bowl on a five-inch screen.

Sure, your Apple II probably seems great just the way it is. But until you boot AppleWorks® 2.0, you won't really know what it's capable of doing.

AppleWorks combines three of the most popular applications in one powerful, easy-to-use package: a sophisticated word processor for swiftly creating dynamic marketing plans or compelling letters home to mom. A spreadsheet for compiling everything from next month's sales forecast to last month's household expenses—then changing the numbers in a flash as you ask questions like "what if I win the lottery tomorrow?" And finally, a database manager to store, sort and organize just about any kind of information you can think of.

Alone, each of these programs is a potent, practical tool.

But put them all together and your Apple II is suddenly traveling in a fast lane you didn't even know existed.

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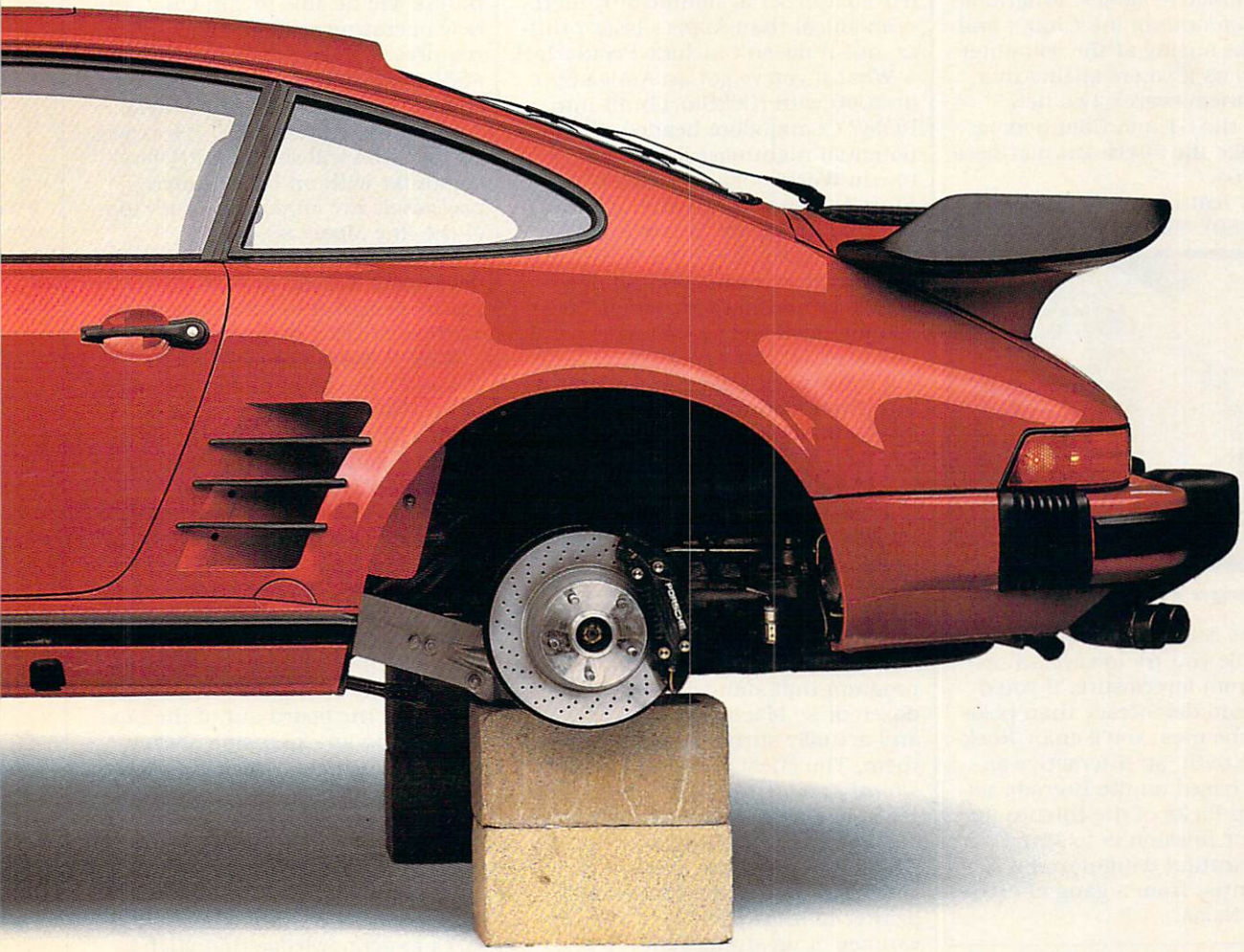


You can zip from your stock portfolio to your monthly budget with a few deft keystrokes. Cut sales projections from a spreadsheet and paste them into a business plan in a matter of seconds. Or use the mail merge function to speed addresses from the data base to a form letter. All without swapping disks or rebooting. Even the learning process is accelerated, since you only have to learn one set of commands.

If all this isn't enough, you can choose from dozens of add-on programs to do things like draw graphs or check your spelling. Or use a RAM disk to take advantage of AppleWorks' extended memory support.

It's no wonder over 750,000 Apple II owners already work with AppleWorks (which is compatible with the entire Apple II family).

For more information and the location of a nearby Claris dealer, call 800-334-3535, ext. 150. If you've got an Apple II parked on your desk, we'll get it on the road to bigger and better things.

CLARIS®

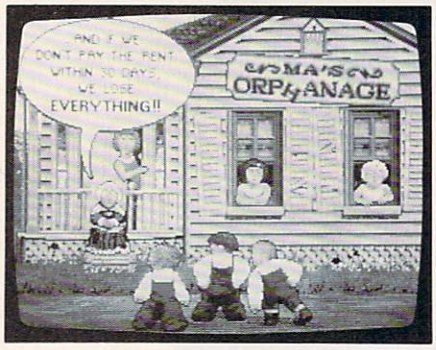
Inc., licensed to Claris Corporation. Apple is a registered trademark of Apple Computer, Inc. For upgrade information, call ***800-544-8554.*** *In Canada, call* ***800-668-8948.***

into *WordPerfect* formats.

To check your version's date, press the Help key and look at the top of the Help screen. If the date is earlier than January 29, 1988, contact WordPerfect Customer Support ([800] 321-5906) for an update. Be sure to have your registration number handy when you call.

Double Feature. Cinemaware Corporation, a leading Amiga developer, has used the plots and characters of feature-length films to make fascinating interactive games. Programs such as *Defender of the Crown* and *S.D.I.* make sitting at the computer almost feel as if you're sitting in a theater. Cinemaware's two new games for the ST and Commodore Amiga evoke the afternoon matinees of the 1930s.

The first feature is *The Three Stooges* ($50). You get to act out



***The Three Stooges* from Cinemaware**

some of the Stooges's most hilarious scenes while you try to save an orphanage from foreclosure. If you'd rather defend democracy than poke people in the eyes, you'll enjoy *Rocket Ranger* ($50), an interactive action game based on the B-grade science-fiction flicks of the thirties and forties. Your mission is to save Earth and the beautiful daughter of a famous scientist from a gang of extraterrestrial Nazis.

MATTHEW STERN *can be reached on CompuServe* (ID: 73547, 2420).

COMMODORE

BY SHAY ADDAMS

The latest versions of *KickStart* and *Workbench* (both 1.3) for the Amiga should be in stores soon. (Ignore rumors about 1.2.1, which was strictly an in-house test version.) The new update package is essentially the same kind Commodore used to introduce version 1.2 and includes a pair of disks and documentation.

KickStart/Workbench 1.3. *KickStart 1.3*'s key new feature enables you to boot from a hard drive. The new *Workbench* has a faster file-handling system, so it loads and saves files and reads directories much quicker. All the previous printer drivers were enhanced to print faster, and a variety of new ones have been added. More Epsons are supported, as well as Hewlett-Packard's color PaintJet, DeskJet, and LaserJet printers. (HP's LaserJet is significantly more economical than Apple's laser printer, but it doesn't include PostScript).

What if you've got an Amiga 500 or 2000 with *KickStart* built into ROM? Commodore headed off that potential nightmare by allowing you to run *Workbench 1.3* with *KickStart 1.2*, so you can still use your internal *KickStart*. It is possible to upgrade either machine to *KickStart 1.3*, but that means adding new ROMs. (If you have an Amiga 1000, you just load the new *KickStart* 1.3, and then *Workbench*.) Theoretically, 1.2 software should run under 1.3, but you're bound to find some programs that won't—so hold onto your *1.2 Workbench* awhile.

C 64 Forever! The C 64 is still kicking, for the latest rumors have Commodore bandying about internal or design changes to extend the machine's longevity. But I've heard no specific plans.

Amiga Desktop Publishing. There is finally an Amiga desktop-publishing program that stands up to the half-dozen or so Macintosh packages—and actually surpasses some of them. The latest version of *Professional Page* (Gold Disk; $395) offers scalable fonts (up to 127-point size) and adjustable leading and lets you flow text around the borders of graphics. You need a PostScript printer to most effectively take advantage of its strengths.

SHAY ADDAMS, *editor and publisher of* Questbusters, *an adventure-game newsletter, can be reached on CompuServe* (ID: 72267,601) *or on QuantumLink* (ID: JBCHALMER).

IBM

BY HENRY BEECHHOLD

Without announcing any specific new products, IBM, in an uncharacteristic move, has hinted at its general plans for the next two years. At every price point, IBM's new products will provide a higher level of performance. In the computer industry, such advances are to be expected. But the rate of change IBM projects is somewhat stunning.

By the end of 1988, its entry-level PS/2 computers (now the Models 25 and 30) are expected to have 80286 microprocessors, the same chip used in the current Models 50 and 60, and will sell for less than $2,000. That means that all the PS/2 computers will be able to run OS/2, the new operating system. Since OS/2 requires 1.5MB of memory, the new PS/2 computers can be expected to come standard with 2MB of RAM. And, by the end of 1989, it's expected that IBM will sell an entry-level computer with an 80386 microprocessor, the chip used in its top-of-the-line Model 80.

IBM also said it is working with developers to help provide 1,000 programs designed to take specific advantage of OS/2 by year's end.

What is Micro Channel? Micro Channel, the most distinctive aspect of the PS/2 computer line, is designed to support hardware multitasking, so that independent processors can perform intelligent functions at the same time. Micro Channel, says IBM, will work as a "traffic cop on a super highway."

In addition, Micro Channel allows the computer to read the expansion boards and adapt the system to the boards without requiring that the user set any configuration switches. Just take the board out of the box, plug it into an expansion socket, and Micro Channel does the rest.

DOS 3.4. Well aware of the large and still growing base of computers incompatible with OS/2, IBM is expected to release PC-DOS 3.4 in a few months, according to reports in trade magazines. IBM, however, refuses to acknowledge that such a product is under development.

This hypothetical version of DOS is said to come with a friendly "shell," which lets you choose some commands from a menu instead of typing them. In addition, the new DOS should be able to handle large-capacity disk drives. The current DOS limit is 32MB; larger drives must be partitioned into two or more segments. →

HENRY F. BEECHHOLD *is author of* The Brady Guide to Microcomputer Troubleshooting & Maintenance *(Brady Books, Prentice Hall Press, New York).*

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All the important components—the body, chassis, drivetrain and engine block—are crafted of metal. The seats are glove leather and the tires are genuine rubber.

Both the engine and the undercarriage are authentically recreated and, of course, the doors and both sides of the hood open.

Each component of this model is individually inspected, then hand-assembled. Note the gleam of the model's finish. It is achieved by polishing each piece of metal, then hand-spraying the paint finish. Finally, and perhaps most remarkably, each car is actually hand-waxed.

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F235

MACHINE SPECIFICS

MS-DOS

BY STEVE MORGENSTERN

I recently looked at new versions of both Microsoft *Windows* and Digital Research GEM, the software "environments" that bring a more or less Macintosh-like desktop to the MS-DOS world.

When it comes to file management and on-screen graphic layout, GEM is the more Mac-like of the two. For exploring and manipulating disk files, GEM's point-and-click method is welcome. Software written specifically to run under GEM is sparse, but it does include *GEM Draw Plus* (a terrific graphics package) and *Ventura Publisher*, my favorite desktop-publishing package. And since you can start virtually any software application from the GEM desktop and return there when you quit, GEM is a friendly way for folks who are DOS-phobic to manage their computers.

GEM 3.0. The latest GEM release, Version 3, does not represent a major change from the previous version, though compatibility with *Ventura Publisher* is improved. The most significant addition is the inclusion of Bitstream's *Fontware Installation Kit* software with the new edition of *GEM Draw Plus*. *Fontware* lets users create high-quality typefaces in many sizes for printing on the HP LaserJet and several dot-matrix printers. Unfortunately, the Bitstream fonts are neither supported nor included with the new release of the GEM *1st Word Plus* word processor.

Windows 2.03. The big drawing card for *Microsoft Windows* is its ability to keep several software applications on-screen simultaneously in separate windows. You could, for example, load your word-processing program, a telecommunications program, and a paint program all at once. Then you could download a document by modem, format it in the word processor, and add a picture from the paint program, all by moving instantly from window to window. That sounds better than it works at this point, unfortunately.

While both *PageMaker* and Microsoft *Excel* are written to run with *Windows*, they are part of a small number of top-notch applications that behave themselves when locked into a *Windows* window. It seems, though, that there is momentum on the side of Microsoft *Windows*, thanks to a strategic alliance with IBM in developing the *Windows*-like *Presentation Manager*, which runs under OS/2.

The *Windows Version 2.03* upgrade is significant. Most noticeable and welcome is the substantial speed improvement. The original version of *Windows* was so sluggish it was nearly unusable on a standard PC-class computer. The second big change is the ability to freely size, move, and overlap on-screen windows, which previously were limited to neat but restrictive halvings and quarterings of the screen.

The *GEM 3.0* package is included with the purchase of any *GEM* software application, while *Windows* is sold separately for $99.

STEVE MORGENSTERN *can be reached on CompuServe* (ID: 72545,606).

TANDY

BY STEPHEN MILLER

I've taken a closer look at *Multi-Vue* ($50) for the CoCo 3 and OS-9 Level II operating system. *Multi-Vue* is the new interface for OS-9 II that operates on the same graphic principle as the Macintosh, Tandy's *Personal* and *Professional Deskmate*, Microsoft *Windows*, and IBM's forthcoming *Presentation Manager*.

CoCo Multitasking. *Multi-Vue* provides an easy way to control OS-9's multitasking capability. While I still like what I see, there are some early drawbacks.

As with any new piece of software, there is the inevitable lag from its introduction until its widespread acceptance. The original delay in shipping OS-9 II caused a slowdown in third-party development of CoCo 3 software that took full advantage of the power of OS-9. Likewise, the delay in shipping *Multi-Vue* will cause a similar backlog. Also, some commercial software written under OS-9 II probably won't run through *Multi-Vue*.

I've tried a number of OS-9 II programs, and all of them crashed when I attempted to load them through a *Multi-Vue* window. There is no problem when the programs are run separately. In order for software to run through a *Multi-Vue* window without any problems, it must be designed to work with *Multi-Vue*. As of this writing, there is no software written specifically for *Multi-Vue* use. That will surely change in the near future. In the meantime, don't panic if you purchase *Multi-Vue* and your favorite program doesn't load properly.

Tandy 1400LT. The Tandy 1400LT portable is, in many ways, a complete system that needs little enhancement for most users. The only exceptions are an internal modem and an internal hard disk. The modem question is answered quite nicely with a 1200-baud Tandy modem that fits neatly in its slot. The modem is the easiest option I have ever installed. Removing the back plate, inserting the modem in the slot, and reattaching the screws are all that is necessary to install the modem. No problems with either the installation or the documentation.

Check to see if the system is set to recognize the modem or the RS-232C connector. By depressing the CTRL, ALT, and INS keys, you get the special setup program that allows you to quickly configure how the computer interacts with its peripherals. The F4 function key determines if the machine will recognize either the internal or external modem.

The other major option missing from the 1400LT is an internal hard disk. Tandy is not saying whether the other open internal slot is intended for this purpose, but some third-party manufacturers have already announced plans to make a 30MB hard-disk drive for the 1400LT. More news as it develops.

STEPHEN MILLER *is a computer consultant and journalist.*

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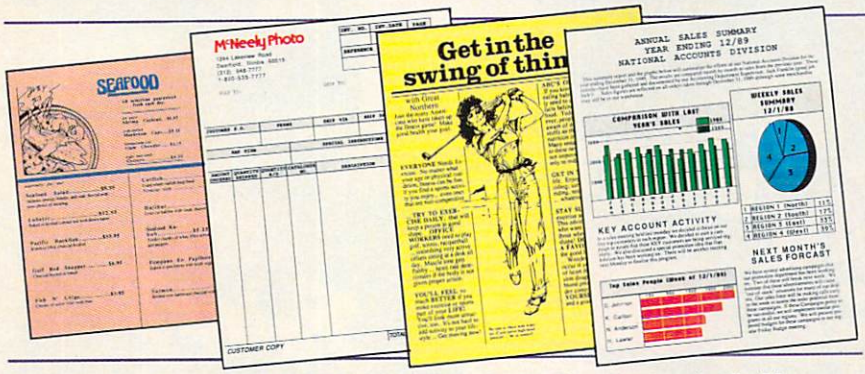

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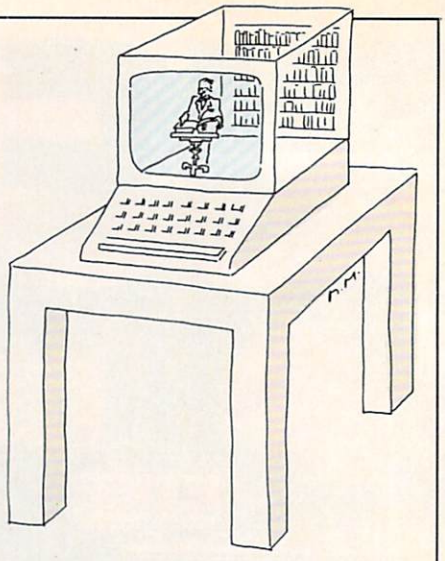
FC-6/88

EDUCATION

DICTIONARIES AND THESAURUSES
Programs That Perfect Your Papers

BY LINDA WILLIAMS



Professor Burton, the toughest, strictest, most feared teacher I ever had, was also unquestionably the best. It wasn't enough for him to grade with the highest imaginable standards. He had a method for lowering scores by taking off a third of a grade for each word that was misspelled, misused, or incorrectly typed. For example, a B- paper could easily, then, become a D. When students voiced their complaints and excuses ("The T key on my typewriter sticks," "My right hand responds faster than my left"), he proclaimed, "In the real world, typographical and spelling errors are not tolerated."

Although Professor Burton may have exaggerated the importance of perfection, he had a good point. It takes only a single, obvious error to make the best-written term paper, resumé, or company memo lose its punch. Now, thanks to computers and the right software, it's easy to turn in nearly flawless work. Spelling-checker and thesaurus software can ease the burden of proofreading your work and choosing the correct words.

The number of electronic spelling checkers and thesauruses available is overwhelming and far too great for us to cover in these pages. Instead, we hope to guide you with the following considerations, so you can make informed choices according to your needs. *(See "A Sampling of Spelling-Checker and Thesaurus Programs.")*

WHAT YOU SHOULD EXPECT

Before you go shopping for an electronic dictionary or thesaurus, it helps to understand the terminology and what you can expect from the software. Electronic spelling checkers work by comparing the words in your document to words in their on-disk dictionaries, which could range in size from 15,000 to more than 100,000 entries. While the program reviews your work—as a finished product, a screen, or individual words—it will mark misspelled words with a highlight, special symbol, or sound. Often, it will then present a list of alternatives, guessing at what you meant to type or spell. You then select the correct spelling and make the appropriate change.

Electronic thesauruses serve an entirely different purpose, yet can prove every bit as valuable. If you are one of those writers who can't continue until the right word comes to mind or who lazily overuses words, you'll find a thesaurus a great tool. As you type a word, you can ask the program to display a list of synonyms or have it review your finished text for word repetitions.

LINDA WILLIAMS *is a reporter/researcher for* Time *magazine.*

A SAMPLING OF SPELLING-CHECKER AND THESAURUS PROGRAMS

Program and Manufacturer	Hardware Requirements/Price	Comments
Spellin! The Add-In Spelling Checker for Lotus Turner Hall Publishing 10201 Torre Ave. Cupertino, CA 95014 (408) 253-9600	IBM PC and compatibles with 120K free system memory; $80	Spelling checker for Lotus *1-2-3* and *Symphony*. Can check a complete worksheet or just a range of cells.
SpellWorks Advanced Logic Systems Alderwood Ave. Sunnyvale, CA 95014 (408) 747-1988	128K Apple IIc/IIe/IIGs; $50	90,000-word spelling checker for *AppleWorks*. Can add up to 3,000 of your own words. Checks entire document and lists misspelled words.
Thunder! Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171	512K Atari ST, 512K Macintosh; $50	50,000-word spelling checker corrects words as you type them in or as a completed document. Automatic replacement option. Works with any GEM-based program.
Turbo Lightning Borland International 4585 Scotts Valley Drive Scotts Valley, CA 95066 (408) 438-8400	128K IBM PC and compatibles (256K recommended), 2 floppies or 1 floppy and a hard drive (requires 83K–95K free system memory); $100	84,000-word real-time spelling checker that beeps when you misspell a word. Can customize program to work with almost any word processor, database, or spreadsheet.
Webster's New World Combo Simon & Schuster One Gulf & Western Plaza New York, NY 10023 (800) 624-0023 (800) 624-0024 in NJ	IBM PC and compatibles with 91K–105K free system memory; $90. Specialized dictionary disks, $60–$70. Spelling Checker and Thesaurus components also sold separately.	Combined spelling checker and thesaurus with 114,000-word dictionary. Specialized dictionary disks available with legal, medical, scientific, Spanish, and French words and phrases. Thesaurus has 20,000 main entries, 330,000 synonyms, and 1 million replacement words. Compatible with more than 40 word processors, spreadsheets, and databases.
Word Finder 2.0 Microlytics, Inc. Techniplex Center 300 Main St. E. Rochester, NY 14445 (716) 377-0130	IBM PC and compatibles with 32K free system memory, Macintosh; $60.	Synonym finder with more than 220,000 word alternatives. Display can be at the top or bottom of the screen. IBM version compatible with more than 32 word processors, *1-2-3*, *Symphony*, and *SideKick*. Mac works with all word processors and *HyperCard*.
Word Writer PC, ST, & 128 Timeworks, Inc. 444 Lake Cook Road Deerfield, IL 60015 (312) 948-9200	C 128, 128K IBM PC and compatibles; $50 512K Atari ST; $80	An all-in-one word processor with 90,000-word spelling checker, 60,000-word thesaurus, and outliner. Can add up to 3,000 of your own words.

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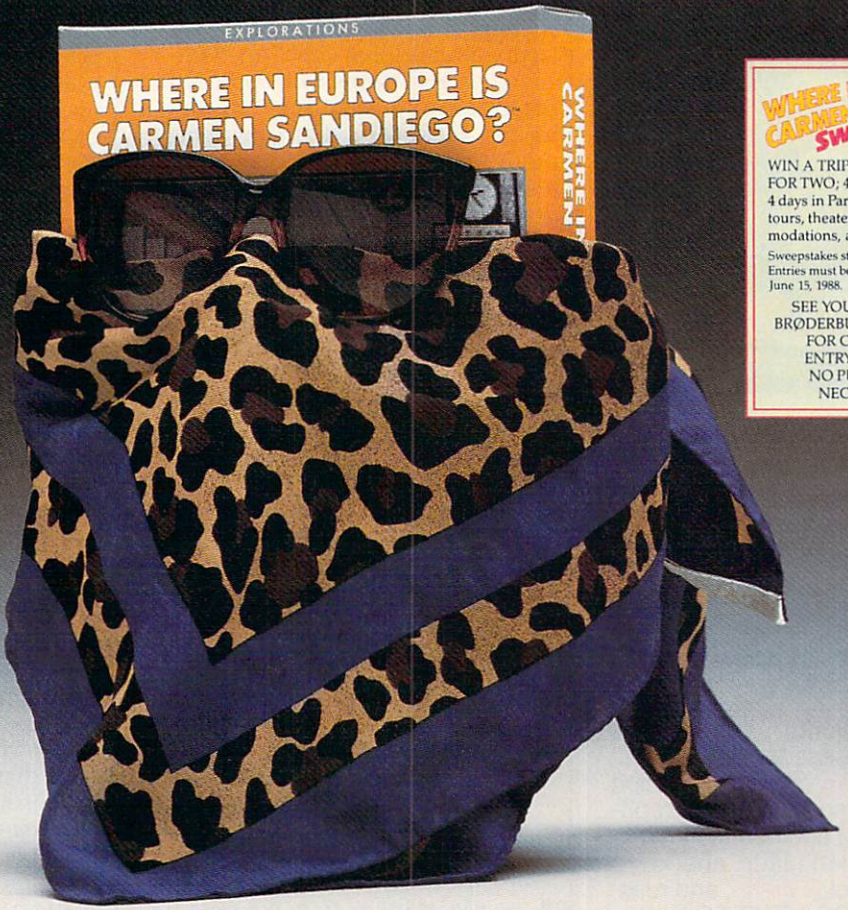

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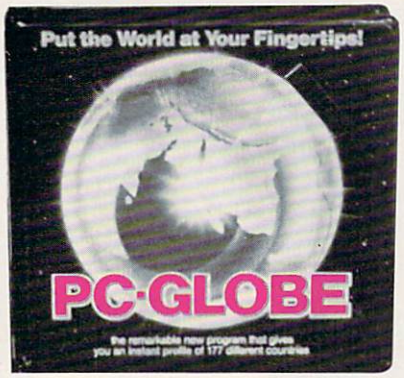

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CIRCLE READER SERVICE 8

EDUCATION

WILL THE PROGRAM AND COMPUTER BE COMPATIBLE?

One of the first points you need to consider when purchasing any software is its compatibility with your system. When buying a stand-alone spelling checker or thesaurus, you have an additional concern: "Is it compatible with my word processor, database or spreadsheet?" By all means, make sure that your computer has sufficient random access memory (RAM) to handle the program(s). Most spelling checkers and thesauruses work most efficiently when installed on a hard drive. From there on, the biggest question you'll have to answer is, "Do I need all of those features?" Generally speaking, the more features, the higher the price. The average stand-alone electronic dictionary costs about $50, but an integrated word processor/spelling checker can run as high as $495. With software, it seems that price becomes less of an issue when the program is used frequently. Expensive is that disk that never goes out for a whirl.

THE BIGGER THE BETTER?

The number of words in an electronic dictionary or thesaurus is a big selling point. Spelling checkers can contain more than 100,000 words, although the best thesauruses contain fewer actual words, but may list some 300,000 "synonym references." One way to make sense of the size issue is to make sure the program contains the words you need. But, some words in your vocabulary will not be in the electronic dictionary, no matter how large it is. The best programs let you customize the dictionary, adding words and names you use often in your writing. Some programs also offer specialized disks with words relating to different professions or foreign languages.

With thesauruses, the key is in the number of alternatives they can show you.

CAN YOU WAIT FOR THE BAD NEWS?

A relatively new selling point for electronic spelling checkers and synonym finders is their ability to check words as you type them. In the early days of these programs, you had to complete the document before running it through the spelling checker. Now, you can use a program that beeps every time you misspell or mistype a word. You may find the beeps and interruptions of "real-time" programs distracting, or you might find they are the solution to writing block; it depends on your writing style. When you have made a simple spelling error or have transposed two letters, you may not want to wait for the program to display all the possible alternatives. Some programs will simply replace the wrong word with the right one, without a long and involved process. Consider your habits: do you find you need a dictionary or thesaurus nearby as you write, or do you wait until you are finished to thumb through these references? Old habits die hard, so you should buy a program in line with your personal needs.

JUDGING BY THE SOUND OF IT

It's frustrating when you have trouble spelling a word you've heard and spoken all your life. And if you don't have the first few letters "write," a dictionary can be no help at all. Thankfully, some of the new programs can interpret these types of errors and offer suggestions for the intended word. For instance, if you type *fenomenol*, the program will search through its 110,000-word dictionary and come up with the correct spelling, *phenomenal*. Spelling checkers are by no means infallible, however. If you type "*Wear is the box?*" instead of "*Where,*" chances are the software won't notice the error.

BEAUTY IS IN THE EYES OF THE USER

As you no doubt have learned, looking at a computer screen can be tiring to the eyes, and certain programs cause more headaches than others. It is crucial, then, to like the looks of the screen. Many spelling checkers and thesauruses place the suggested word substitutions in the middle of the display, overlaid on the text. That may not bother you, but if you want to see the word in context, you might prefer a program that has a top- or bottom-screen display. The importance of this feature, like most, depends on your preference.

And speaking of personal preference, I recently heard that Professor Burton has retired. Who knows, maybe he felt that computers had taken the fun out of his job. ■

ENTERTAINMENT

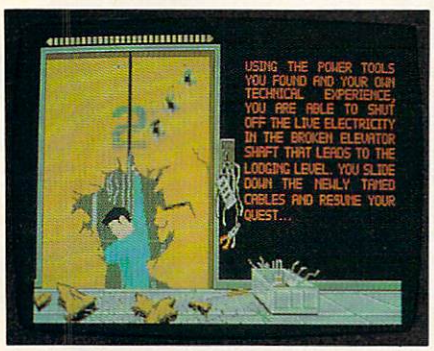
HINTS AND NEWS

NEWS AND RUMORS

★ Do you burn the midnight oil playing games at your computer only to end up tired, frustrated, and worst of all, stumped? ***Quest for Clues*** ($25), a book from **Origin Systems** and **Shay Addams**, a contributing editor for FAMILY & HOME-OFFICE COMPUTING, provides clues and solutions to 50 of the most difficult adventure and role-playing games, including ***King's Quest III***, ***Ultima IV***, and ***Wizard's Crown***. End those sleepless nights and tackle your stack of unsolved games. You can find *Quest for Clues* at your local software store or order it from Origin Systems ([603] 644-3360).

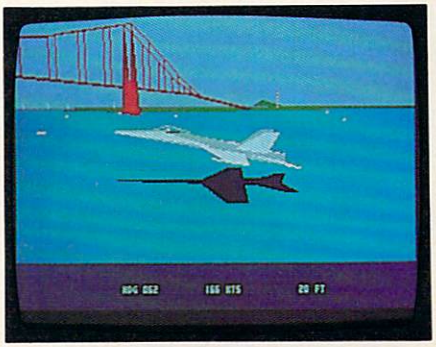
★ **ALF**, the furball from outer space and star of the NBC television show "ALF," has made his way to the computer screen in a multilevel, multipath, maze-style game of the same name (**64K Apple**, **C 64/128**, **256K IBM PC**, $15; published by **Box Office Software**). ALF from Melmac has crashed to earth in his spaceship, and the dog catcher is hot on his tail. Race against a clock as you help ALF get his paws on pizzas, cats (his favorite delicacy), and parts to rebuild the spaceship that will send him back home safely.

★ Enter the twenty-first century and the world of advanced experimental science in ***Alien Mind***, from **PBI Software** ($55). You are part of a biological research team studying new forms of alien life. Arriving at the laboratory, you find no sign of human life, and you become locked in the lab. The alien has taken over, and, in order to survive, you must combat more than 100 monsters and robots and construct a super weapon to neutralize the alien. Created for the **Apple IIGS**, ***Alien Mind*** is an arcade–space adventure that showcases the brilliant graphics, smooth animation, and stereo-quality sound of the IIGS.



***Alien Mind*, an arcade/space adventure from PBI.**

★ Buy two **Electronic Arts** (EA) software titles before July 31, 1988, and get the third free! Choose from 42 of the latest entertainment, music, paint, video, and utility packages. For more details, visit your favorite software dealer or call (800) 245-4525. . . . **EA** has recruited hoops superstar **Michael Jordan** as a co-designer for an upcoming basketball game. First Larry Bird and Julius Erving, then Chuck Yeager, Earl Weaver, John Madden, and now Jordan—who will be next? Jordan's game should be on software shelves later this year. . . . **Karl Buiter**, creator of ***EOS: Earth Orbit Stations***, will bring us ***Futuremagic*** (**256K IBM PC**, $50), scheduled for release in August. ***Futuremagic*** should appeal to fans of ***Starflight***, winner of FAMILY & HOME-OFFICE COMPUTING's Critics' Choice Award for Best Game of 1987. "***Starflight*** showed that characters in a fantasy game could be as rich as characters in a novel, and that's even more true in ***Futuremagic***," said Bing Gordon, vice president of the EA's Entertainment Division. The game is set in a three-planet system besieged by raiders from an unknown source. You'll explore starships and planets, get a first-person view of the terrain, and converse with characters who will "remember" earlier conversations. . . . And ***F/A-18 Interceptor***



In *F/A-18*, you'll pilot your F-18 under the Golden Gate Bridge.

(**512K Amiga**, $50), lets you pilot an F-18 Hornet or an F-16 Falcon in combat missions over the San Francisco Bay area. The three-dimensional graphic model of the City by the Bay is spectacular: the Transamerica Pyramid, Golden Gate Bridge, and Bay Bridge cast shadows, as do the planes. Missions range from guarding Air Force One at San Francisco International Airport to shooting down incoming cruise missiles; there's also a top-secret mission for advanced pilots.

★ **Andrew Greenberg**, author of the best-selling ***Wizardry*** series and head of a new software company called **Masterplay**, is introducing a new genre of multiplayer game: a real-time space adventure, for one to six players, with novel-like depth and board-game strategy that Greenberg calls "dynamic theater." ***Star Saga: One, Beyond the Boundary*** (**64K Apple**, **128K IBM PC**), four-and-one-half years in the making and the first of a planned trilogy, is ready now. You'll adopt one of six personae on a colonized planet. Three hundred years ago at the peak of colonization, an alien space plague endangered humanity and invaded the Nine Worlds. Consequently, the government set up a boundary encircling the Nine Worlds. You are destined to leave the safety of the boundary and begin a career of galaxy exploration, but you will not be

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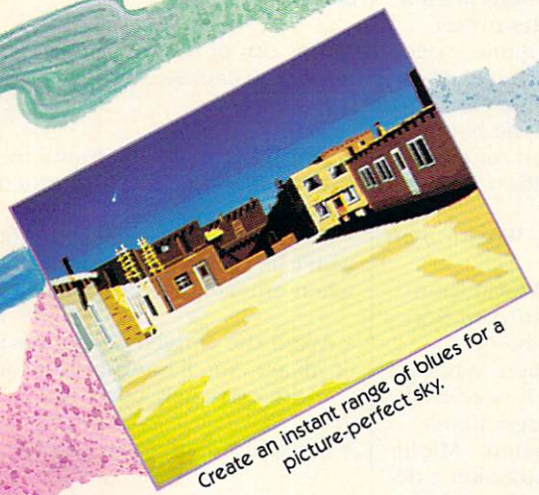
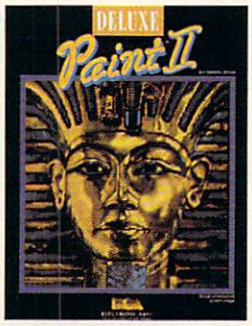


Create an instant range of blues for a picture-perfect sky.



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allowed to return. In ***Star Saga***, the computer acts as a game master, keeping track of players' moves while they consult booklets, rules, and other board-game-like components and move tokens along the game map. There are no dead ends!

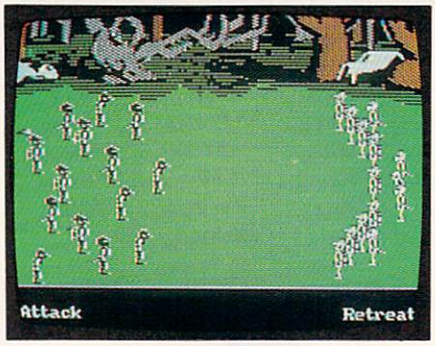
* Another new software firm, **First Row**, announced its first entertainment titles. ***Prime Time*** (**512K Amiga, 512K Atari ST, 512K IBM PC**, $40) is a satirical look at the world of TV network programming. You'll play a network programming executive who's out to get the best ratings for the network. Attend power lunches and network board meetings. There are

Your TV network desk in *Prime Time*.

even commercials that interrupt the play. . . . Next, First Row offers a space adventure, ***Star Empire*** (**C 64/128, 256K IBM PC**, $25). Build a galactic empire, trade with other Starbases, destroy aliens, and forge dangerous missions on your way to becoming the greatest space pilot of all time. . . . Finally, First Row worked with **Michael and Muffy Berlyn**, the creators of ***Tass Times in Tonetown*** and ***Infidel***, to present ***Dr. Dumont's Wild P.A.R.T.I.*** (**48K Apple, 256K IBM PC**, $40). Hoping to boost your lab grade, you volunteer to help Professor Dumont with his new experiment. The professor informs you that you'll experience life on the subatomic level as the first Subonaut. Biolink electrodes are attached to your temples and your arms and legs, but then something goes wrong! The lid closes, and you find yourself inside a mad machine!

GAME HINTS

THE ANCIENT ART OF WAR (Broderbund). In this strategy/tactics war game, you command troops against



***The Ancient Art of War*, a strategy/tactics war game from Broderbund.**

one of six computer opponents. The computer can fight your battles, or you can zoom in and personally command your troops. The final goal is to wipe out your opponents by capturing their flag(s). Choose from predetermined battles or create your own campaigns with the generator. (256K IBM PC)

* When traveling through dense forests, risky waters, or mountains, move the cursor over the squad you wish to move and hit 'I' (for information). Reset the squad's speed to 'march slow.' Type 'E,' then 'M.' Once the squad reaches its destination, move the cursor over the squad, type 'M,' and barely move the cursor (diagonal movement is quickest) in the direction you wish to travel; then type 'M' again. Immediately increase the game speed (the 'T' key). Your squad will start with a jerk and move closer to its preset destination. Return the game speed to slow (press the 'T' key once) and immediately repeat the process. Your squad will quickly cross the barrier with little loss of life, food, or condition (spies are the exception—they die easily).

—DAVID BAILEY, *Forks, Washington*

MIGHT AND MAGIC (New World Computing/Activision). You start in Sorpigal, one of the five towns of V.A.R.N., and your mission is to find the Inner Sanctum. You'll use 95 different spells and 250 magic items and encounter 200 monsters. *Might and Magic* is truly a mapmaker's delight! (64K Apple, C 64/128, 256K IBM PC)

* To enter four out of the six castles, you'll need a Merchants Pass. If you don't have a Merchants Pass and want to enter the Castle White Wolf, cast the Jump spell over the guards.

* When you start the game, make sure your characters have high speed. Otherwise, you won't be able to retreat.

* Always have one of each class in your party.

* Don't leave Sorpigal until you are at the third level.

* Read all the plaques that are on the statues in Sorpigal.

* There are eight statues, not seven.

* For a head start, cast sleep on your opponents when you begin a fight.

* Make sure your party is at least half female, or you'll run into trouble in Portsmith.

* Always fight the biggest and baddest monster first.

* Don't search abandoned objects (Merchants Cart and Decaying Ship) until you are at least at the fourth or fifth level.

* Always donate at Temples. The price will go down.

* Algary is the gateway to other cities.

* Stay out of the mountain passes near the Glaciers; there are a lot of avalanches.

* Multiple-choice questions in the castles can alter your alignment.

* Get a Merchants Pass, so you won't be recognized as a peasant when entering castles.

* Avoid the winged beasts northeast of Algary. You'll end up dead unless you are extremely powerful.

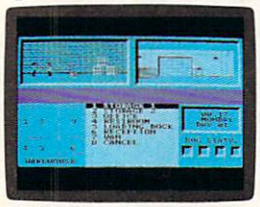
* Beware of Paul Pead and his boys.

* Always get smelling salts, so you can wake up if something or someone attacks you.

* Find Arenko Guire in the Guires Grove. He is located at sector: d-3, surface: x-0, y-2 facing west.

TAKE THE LAW INTO YOUR OWN HANDS.

What can you do about the drug problem in America? Play *L.A. Crackdown.* That's what. You're the veteran detective. Your assignment is to uncover a major ring bent on distributing an evil synthetic drug.



You can bug the thugs and watch the warehouse, both at the same time.

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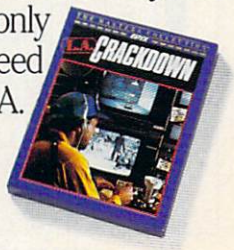
You'll also need to draw on every strategy brain cell available. If you're not thinking every minute, you might just spend all evening waiting on a street corner for a suspect who's never coming.

L.A. Crackdown. If you think your nervous system can handle the surprise action and tricky mental clues, there's only one thing you need to do. Move to L.A.



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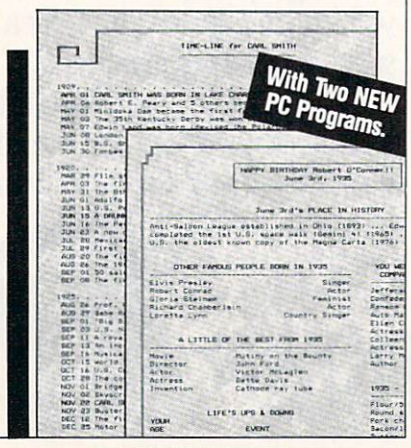


CIRCLE READER SERVICE 24

ENTERTAINMENT

★ The abandoned Merchants Wagon is located at sector: c-1, surface: x-5, y-7.

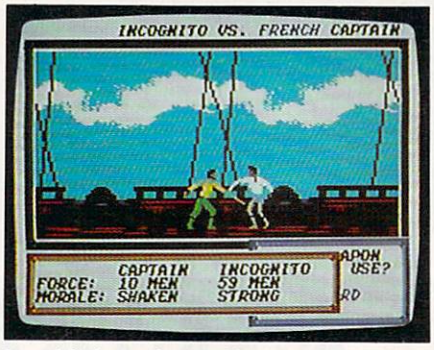
★ Glaciers in castles are actually doors.

★ When your magical characters advance, the sorcerer spell Energy Blast and the clerical spell Power Cure become very potent.

★ Surrender to a group of sprites, or they will cast curses on you until you can no longer hit them. Then they will attack full force and wipe you out. Sprites are also unaffected by sleep spells.

—STEVE MALMSKOG, *Downey, California*

PIRATES! (Microprose). You're a seventeenth-century merchant trader, pirate, buccaneer, or pirate hunter in the thick of the action on the Spanish Main in the Caribbean. Bargain with merchants and negotiate with government officials in more than 50 foreign ports. Challenge your reflexes in simulated sailing, sea and land battles, and sword fights. From romance to buried treasures, *Pirates!* combines role-playing adventure with the military, political, financial, strategy, arcade, and simulation genres to take you on a quest for power and prestige. (128K Apple, C 64/128, 256K IBM PC)



Sword fight in the Caribbean in *Pirates!*

★ If you want to reach a town when the wind is against you, you should sail your ship in a zigzag course to avoid damage.

★ You'll get more gold by taking advantage of the treasure maps than by attacking most towns, but your reputation will suffer.

★ Rescue long-lost relatives. They have a pleasant surprise for you.

★ Don't rush to tie the knot. You'll have more informers if you just make pleasant conversation with governors' daughters.

★ When you capture a pirate, don't ask for information about the Silver Train or the Treasure Fleet: hold him for ransom. You can get that information from an informer.

★ If you keep a pirate too long, he will jump ship.

★ If you're an infamous captain, don't go into hostile towns, or you'll have to fight governors' guards.

★ The easiest way to capture a ship is to damage the hull until it leaks and then board it.

★ Big ships aren't always better.

★ Your reputation will suffer if you retreat from a fencing fight.

★ If you lose a ship, you lose some of your gold.

★ Every time a member of the crew deserts, he takes his share of the gold.

★ In general, pirate crews are larger than the English, French, Spanish, or Dutch crews.

★ If you're a good fencer, you can defeat a town, even if the town soldiers outnumber your crew members.

★ Don't get amnesty from a country you plan to attack.

—MICHAEL TURLEY, *Golden, Colorado*

SEND US YOUR HINTS—AND WIN A FREE GAME!

Don't miss the opportunity to share your original game hints and tips with other readers. Submit entries to: Entertainment Editor, FAMILY & HOME-OFFICE COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, telephone number, a short description of the game, and the brand and model of computer you own. If your tips are selected for publication, we'll award you a new game for your computer. We reserve the right to edit submissions for accuracy, clarity, and length. Unfortunately, we won't be able to acknowledge each submission. ■

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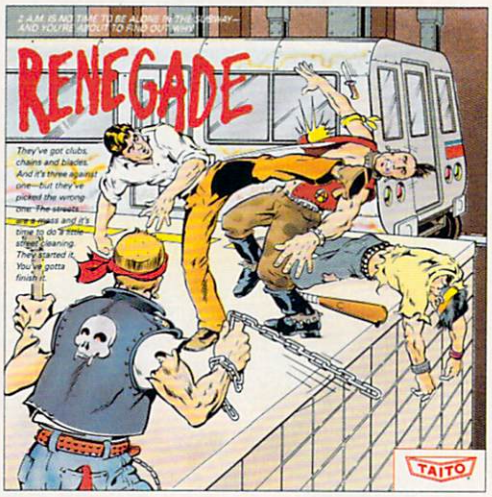

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Our strength comes from the massive development effort we put into creating the kind of games that satisfy the ever-growing arcade appetite and the research gathered from the more than 100,000 arcade machines Taito operates in Japan. (The money in the coin boxes at the end of the day tells very quickly if you've got a good game or not.) And Taito is always working hard to develop the most exciting new video

ALCON: The ultimate in inter-planetary combat. Battle aliens with lasers, homing missiles, bombs and shields. Fantastic vertical scrolling future-world landscapes.

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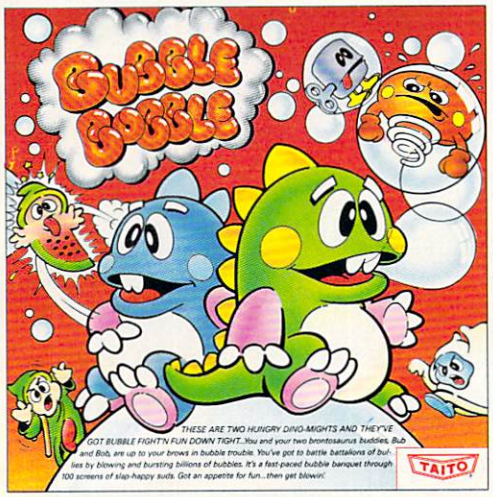

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**If you think you've got the technical and creative ability to develop mind-blowing video games, write to Taito, Attention: Product Development, at the above address.*

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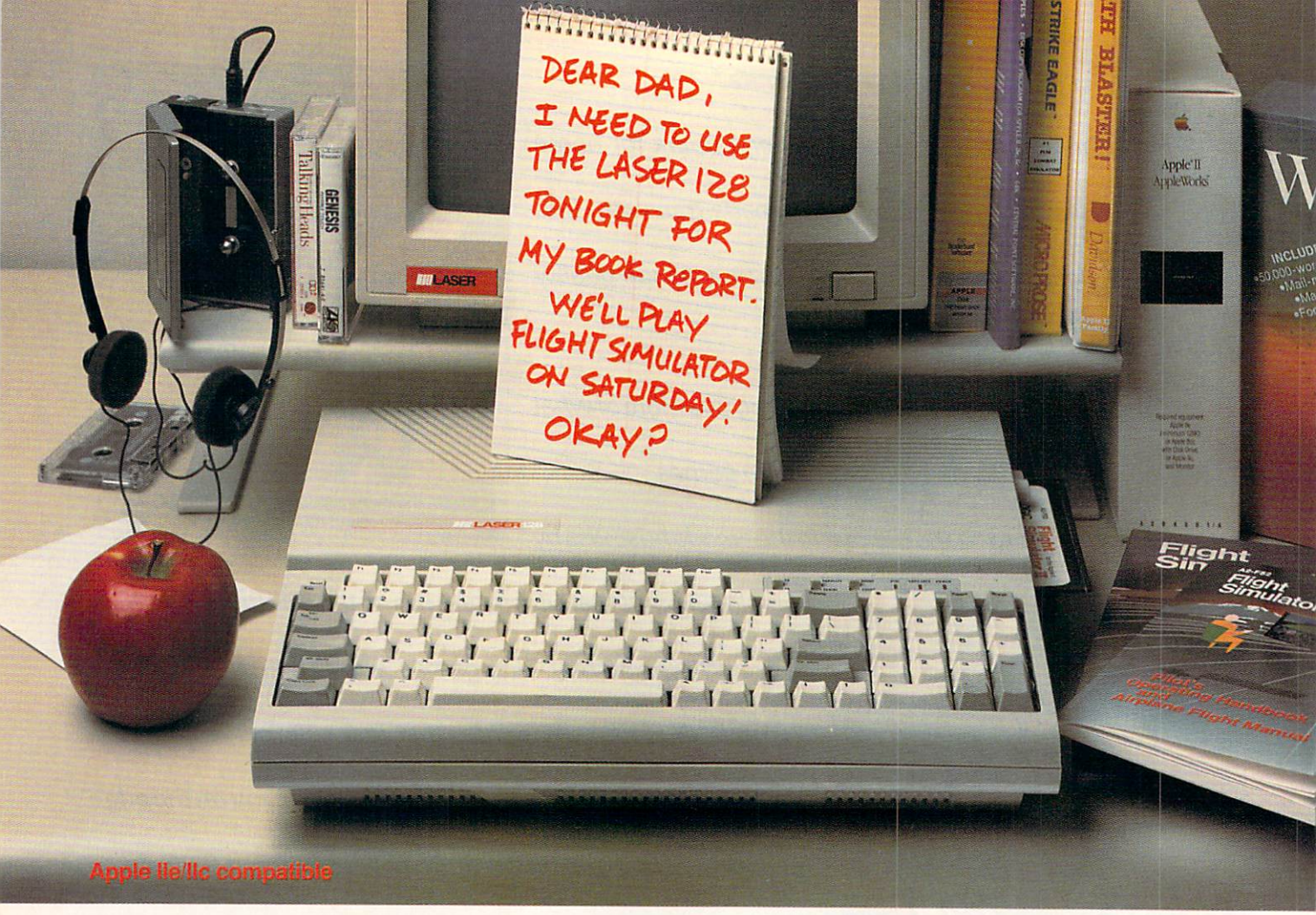

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The Laser 128 with all its features: built-in disk drive; 128K RAM (expandable to 1 megabyte); serial, parallel, modem and mouse interfaces; 80 column text mode; numeric keypad; and an expansion slot; makes for a pretty educated buy. When you do your homework on which computer to buy, you'll find the Laser 128 at the head of the class with value. For more information on the Laser 128 and the name of your nearest dealer, contact Video Technology Computers, Inc., 550 Main Street, Lake Zurich, IL 60047, or call (312) 540-8911. In Canada, call (604) 273-2828.

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CIRCLE READER SERVICE 35

FAMILY & HOME OFFICE COMPUTING

BUYER'S GUIDE TO COMPUTERS

BY STEVE MORGENSTERN

HOW MUCH WILL YOUR MONEY BUY?

Two roads diverged in a wood, and I——
I took the one less traveled by,
And that has made all the difference.
(Robert Frost, "The Road Not Taken")

Are you wondering why you're reading Frost's poetry in a computer magazine? Because as the poem suggests, when you purchase a computer, you select a single road out of many possibilities and will be restricted to that path for as long as you own that computer.

How do you decide which path to follow—or where to sink your money? The price versus performance tradeoffs in computer shopping are not black and white. You can't simply compare technical specifications and make a decision. Software and hardware availability do matter. The warranty matters and so does the reputation of the manufacturer offering that warranty.

Even more elusive, but no less important, are industry trends. Are there exciting new developments under way for a particular brand of computer, or is the manufacturer losing ground? Does a system represent a technological dead end, or does it promise an easy upgrade path to more powerful computing if your needs demand it? This kind of information requires a perspective that is generally hard to find when speaking with salespeople, cousins, and afficianados of particular systems, so we'll focus on some of these issues in the following guide.

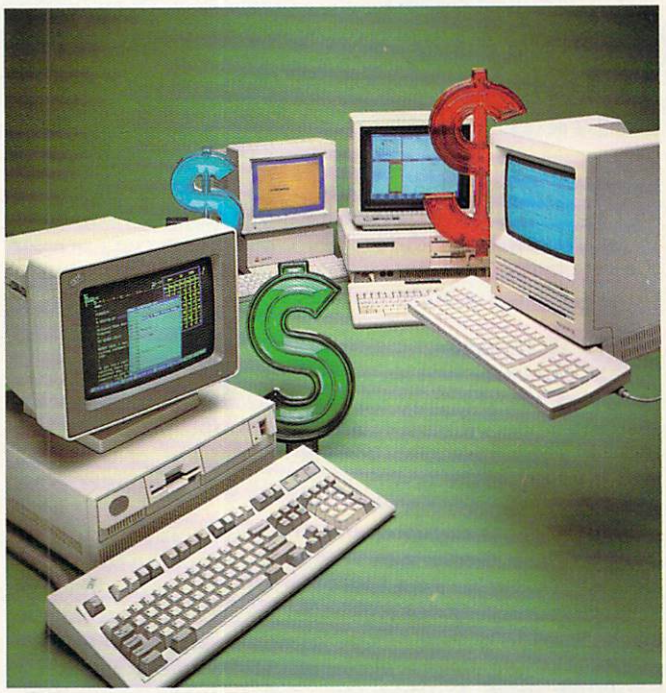
HOW TO USE THIS GUIDE

While cost should never be the only factor that sways a computer purchase, money obviously plays a key role in many buying decisions. That's why we've segmented our short descriptions of computers into price classifications: Less than $1,000, $1,000–$2,000, and $2,000–$4,500. Our price breaks are based on the cost of the basic system, as detailed in the accompanying chart. Each unit includes a monitor, two floppy-disk drives (or one floppy and one hard-disk drive on AT-style computers), and the basic system software required to start and run the machine.

Rather than include every model from every manufacturer, we've chosen to give you a sampling of the newer or more popular models from the major manufacturers. In choosing machines to review, we've given precedence to those that are heavily advertised and widely distributed. The chart (on page 44) includes some models not reviewed.

There are several points to keep in mind when looking at prices. One, the manufacturers' suggested list prices, given here, are almost always discounted by retailers—

Contributing editor STEVE MORGENSTERN *wrote "Solving the IBM-Compatibles Puzzle" in the March issue.*



PHOTOGRAPH BY PAUL D'INNOCENZO

up to 30 percent. You can find better prices than the ones in our chart. Two, we've assembled two-disk drive productivity systems. (If you plan on using a computer for education or entertainment, you can often get by with one disk drive.) Three, some color systems can be used with a TV instead of a color monitor. Four, if you see advertised prices that are unusually low, the prices might not include a monitor or a keyboard or two disk drives.

LESS THAN $1,000

A number of PC-compatible MS-DOS computers fall into this category. The Amstrad, Blue Chip, Leading Edge Model D, Dell System 100, and Vendex all sell for less than $1,000 for complete two-drive systems. In fact, because MS-DOS machines have become such commodities, these systems can be cheaper than Apple IIs or Commodore 128s!

This price category also includes a number of the old favorites, with plenty of software available and enough units sold to assure buyers of continuing support. The Commodore and Tandy computers, along with the Apples (though not in this price category), spurred the initial computer boom, and they have been updated to keep pace with new technology, insofar as possible.

While these computers are not generally considered to

LESS THAN $1,000

Amstrad PC1640

Vendex HeadStart Turbo 888-XT

Leading Edge Model D

be business machines, many people find the hardware and software needed to conduct business operations on them. Nonetheless, the lack of corporate acceptance for these "classic" computers is a critical consideration if you are planning to bring disks home from the office.

AMSTRAD PC1640

This MS-DOS British import is similar in most respects to the company's earlier PC1512, but it boosts system memory to 640K and adds built-in support for EGA and Hercules graphics standards. The price is still low, and the value is still high, but the computer does have its quirks.

This model is designed for first-time computer users, from its clear, lead-you-by-the-hand manual to the inclusion of the GEM point-and-click desktop environment. The system is ready to run when you remove it from the box, complete with a mouse. However, the GEM system comes on three disks and can be clumsy to use without a hard-disk drive. Furthermore, you may encounter difficulty when running some applications under GEM.

The keys on the keyboard are too cramped for some, and the layout is nonstandard. And the decision to place the power supply inside the monitor instead of within the system unit is a mixed blessing. There is no need for a system fan with this configuration, making the machine blessedly silent, but you do have to use an Amstrad monitor. The Amstrad is a good monitor, but if it breaks down, the system goes down with it.

BLUE CHIP pcPOPULAR MODEL 2

The Blue Chip is a basic MS-DOS machine, but good value for the money. It has two speeds and comes standard with two 5.25-inch floppy drives, along with a mouse (a nice extra!) and color/monochrome graphics. Bundled software includes MS-DOS 3.2, GW BASIC, and a tutorial program called *GO!* to help newcomers get started without mastering the intricacies of DOS.

The system is sold with only 512K memory, instead of the standard 640K, and the keyboard is not as sharp to the touch as those of more expensive computers.

LASER 128EX

The Laser 128EX is a "loaded" Apple IIe/IIc compatible computer that sells for significantly less than the Apple machines do. It resembles the Apple IIc with its built-in disk drive, but the Laser 128EX adds an RGB color monitor connector and a parallel port to support a wider choice of printers. Like the IIe, the Laser has two slots for standard Apple IIe expansion cards.

With the Laser's memory (expandable to 1MB) and speed (it's faster than an Apple IIGS!), programs such as *AppleWorks*, *WordPerfect*, *and MultiScribe* really benefit. If you wonder whether a certain program will run, the manufacturer, Central Point Software, can provide a list of tested programs. All in all, the Laser 128EX is an extremely good value.

TANDY COLOR COMPUTER 3

While Tandy has built up a line of very respectable MS-DOS computers, it has not abandoned its commitment to the venerable Color Computer. You can easily find service for the CoCo line. And while the software selection is limited compared to the Apple and Commodore computers, you can undoubtedly find what you're looking for at your local Radio Shack store.

The CoCo 3 can use a TV set or an optional RGB monitor for display (the monitor lets you take advantage of four colors at a crisp 640-by-192 resolution). The system's 128K memory is expandable to 512K, which you'll need if you want to use the sophisticated operating system called OS-9 Level II (it allows multitasking). The CoCo's sound capabilities are marginal, and the keyboard is not designed for heavy typing. Nonetheless, there are some solid business programs available, including the *VIP* series.

VENDEX HEADSTART TURBO 888-XT

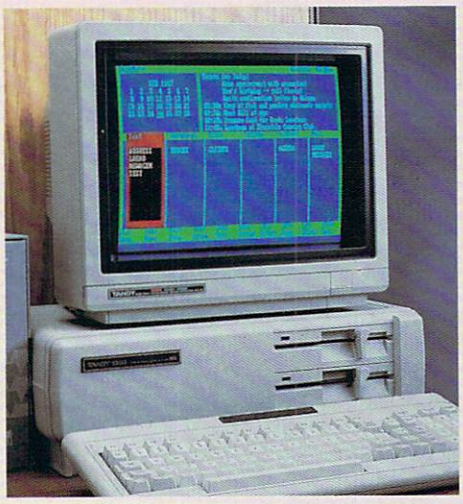
The Vendex has two floppy drives and a monochrome monitor and comes bundled with MS-DOS, GW-BASIC, spreadsheet, database, and word processor, along with an accompanying applications software manual. The company claims the Vendex HeadStart computer system is easy to use, and indeed, the hardware and monitor work fine, the application programs included are respectable, and the price is good. But like any other new computer owner, you'll have to spend some time learning how to use the computer before churning out any work.

$1,000–$2,000

Some of the toughest buying decisions arise in this price range. You can go with the Apple IIe, its high-end rendition, the IIGS, or the Commodore 128D. The newer

FROM $1,000 TO $2,000

Apple IIGS


Tandy 1000 SX

IBM PS/2 Model 25

Commodore Amiga 500 and the Atari 1040ST and Mega ST also fall into this category; they come with a mouse and a point-and-click operating system. At this price you will have a good selection of fully loaded IBM PC compatibles, including the Dell System 100 and Epson Equity I Plus *(see the chart for more examples)*. And you can find some complete IBM PC AT-compatible systems. The chart includes the Blue Chip Master PC 286-12, Hyundai SUPER-286c, and Leading Edge Model D2.

Depending on your needs, of course, the best deal for the money is a "loaded" PC compatible. While you can find systems for less than $1,000, for a little more cash outlay you can add a hard-disk drive and often EGA color graphics.

APPLE IIe/IIc

Apple loyalists live by the slogan "Apple II forever," and they may not be far off the mark. The Apple II line (excluding the IIGS) is now more than 10 years old, and its speed and graphics capabilities are showing signs of age. Still, there is a tremendous variety of high-quality software and hardware available for the system, with more appearing all the time. With expanded memory, there's plenty of word-processing and spreadsheet power. And thanks to Apple's commanding presence in the educational market, there is probably more educational software available for the Apple II than for any other system. What is surprising about the II line is its high price, given its age.

The IIe and IIc run the same software; the primary differences are size and expandability. The IIe is substantially larger and harder to move. You have to add cards to install a printer port and monitor interface. With eight internal expansion slots, there's still plenty of room for memory expansion, internal modems, speech synthesizers, a mouse port, and other forms of system expansion. Since the top pops off easily, all of these additions can be made by the user.

The IIc, on the other hand, is a closed system, though your dealer can open the case to add a memory expansion unit. But most of the options people add to a IIe are already built into the IIc, including a disk drive, a mouse connector, and two serial ports for connecting printers or modems. The system also includes an RF modulator for using a television set as a display device. In addition, the IIc is small and lightweight, ideal for a cramped office.

APPLE IIGS

This computer has tremendous potential, much of it still untapped. It can handle up to 8MB of memory, runs nearly three times as fast as the Apple IIe, boasts a palette of 4,096 colors (up to 256 on-screen simultaneously), and includes a very sophisticated sound chip. Although most Apple II software runs on the GS, software designed specifically for the GS takes full advantage of the mouse-based system with pull-down menus and icons. Though its microprocessor is not as powerful as that of the Macintosh, Amiga, or Atari ST, the GS is an exciting creativity machine. However, the high price and the cost of adding the RGB monitor (to maximize the color capabilities) and upgrading memory from 256K make this a major investment for a machine that so far has not made its mark for business use.

ATARI MEGA ST

The new heavyweight in the Atari ST lineup comes with either 2MB or 4MB (depending on the model) of RAM and a new custom "BLiTTER" *(Atari's spelling, not ours)* chip, the long-awaited and much-promised graphics that greatly enhances the system's already impressive animation capabilities. With *Microsoft Write* and *Professional Publisher* out for the ST—along with the Atari-Laser printer—Atari is currently making a push in the business-presentations market. The combination of large memory capacity, striking graphics, and low price makes the Mega ST a potential bargain. The drawback, as it has been all along, is that you won't find many other STs out there with which to share files. And new software will be slower in coming than it will be for other systems.

COMMODORE 128/128D

The Commodore 128 has three different modes and twice as much standard memory as the popular Commodore 64 does. It emulates a Commodore 64 flawlessly. It can also run software written for the old CP/M operating system, but most people probably won't ever want to do that. And in the 128 mode, it has improved display capabilities (80 columns of text versus the C 64's limited 40-column display), a more powerful version of the BASIC programming language, and access to the quicker Commodore 1571 disk drive. There isn't much software written to take advantage of the 128 mode, though.

The GEOS operating system (a Macintosh-like icon-

based "environment"), along with a GEOS word processor and paint program, is included with the computer, and many additional GEOS software applications are available. To take full advantage of GEOS, you will want to add a mouse (only $50 and well worth it) and consider the Commodore Expansion module that boosts system memory from 640K. In addition, a 3.5-inch disk drive is available from Commodore.

The latest version of this system, the Commodore 128D, has a built-in 1571 disk drive and a detachable keyboard with numeric keypad.

EPSON APEX

The Epson Apex, not to be confused with the Epson Equity line, is sold only through mass-market outlets. It's a neat, compact MS-DOS system, the downside being that it has only two expansion slots. The Apex is aimed at first-time users and comes with *pfs: First Choice* software. Thus, you can go home and start computing right away—without making an additional software purchase.

If you like the Epson name and design but want more memory, speed, or expandability, look at the Epson Equity computers.

IBM PERSONAL SYSTEM/2 MODELS 25 AND 30

When is an IBM PS/2 computer not a PS/2 computer? When it's a repackaged IBM PC, like the Model 25 and Model 30, neither of which includes the significant design changes that differentiate the high-end PS/2 models (PS/2 50, 60, and 80). The two low-end machines in the line share in IBM's move to 3.5-inch disk drives, but lack the Micro Channel expansion-card architecture (MCA) and full Video Graphics Array (VGA) color graphics and will not run OS/2.

At the same time, you could argue that for most computing needs, the Micro Channel system is a drawback, since the required MCA expansion cards are expensive, and the selection is limited. And VGA graphics can be added to any computer with an open slot; the PS/2 25 and 30 are no exception.

The PS/2 Model 25 is a compact unit, with a monitor built into the system unit and a separate keyboard without a numeric keypad (an enhanced keyboard with keypad adds $45 to the price). With only two slots, expansion capability is limited. Officially, the system will not support an internal hard disk, but many users have successfully added one-piece hard-disk cards—a workable solution, but more expensive than a standard internal hard disk. Available with monochrome or color monitors, the display is first-rate and offers up to 256 colors (or 64 shades of gray) if you use software that supports this configuration.

The Model 30 is a more traditional-looking computer, with the standard IBM keyboard and a separate monitor. It is a reliable and relatively speedy PC compatible, with three expansion slots and a built-in port for connecting a mouse.

If you have a special fondness for the IBM logo on your equipment, consider these baby PS/2s, but understand that the logo goes for a premium price. For the same investment, you could move up to a loaded AT-compatible from an equally reputable manufacturer.

TANDY 1000 HX/TX

The HX and TX are the latest models in the 1000 line of MS-DOS computers. The HX has a one-piece, keyboard/disk drive/CPU design. It comes standard with a single 3.5-inch disk drive and 256K memory expandable to 640K. The second disk drive must be external. MS-DOS 2.1 is built into ROM—handy because it lets the system boot up immediately when you power on, but of no use when using a program that requires DOS 3.0 and higher. There is room for three expansion boards, but they have to be Tandy's own. The *Personal DeskMate 2* software comes bundled with the unit.

The TX is significantly more powerful than the HX. It's a hybrid—with the same 80286 microprocessor as an AT computer, but the internal system architecture of a standard PC. That makes it a fast PC, but not an AT. The system comes with 640K memory and five 10-inch internal slots, too short for standard full-length PC expansion boards. A single 3.5-inch disk drive is standard; you can add either a 3.5-inch or 5.25-inch drive.

$2,000–$4,500

With a few exceptions (noted below), the battle lines are clearly drawn in this price category—you can buy an IBM PC AT compatible, or you can buy a Macintosh. Despite all the mudslinging, the simple fact is that any job you can accomplish with one, you can accomplish with the other. Each has its own strengths and weaknesses, and, of course, significant stylistic differences.

American business is still overwhelmingly MS-DOS oriented, but the Macintosh has developed substantial momentum. The graphic orientation of the Macintosh had a strong initial appeal to a few isolated corporate areas—the art department, advertising, and in-house publishing operations.

What changed the Macintosh from a back-door acquisition into a respectable corporate purchase was its relative ease of use. That's a function of the point-and-click, mouse-based user interface, but also the consistency found among virtually all Macintosh software. If you know how to use one Mac program, you have an enormous headstart on using anything else you boot up. This cuts training time, increases productivity, and generally makes managers and workers happy.

Presently, the Mac is definitely a "hot" machine. The Macintosh II, with its color screen and high-powered 68020 microprocessor, has helped to generate increased excitement. With a price tag in the $7,000 neighborhood for a functionally configured system, the Mac II is beyond the boundaries of this category, but it has helped to focus third-party developers' attention on the entire Mac line.

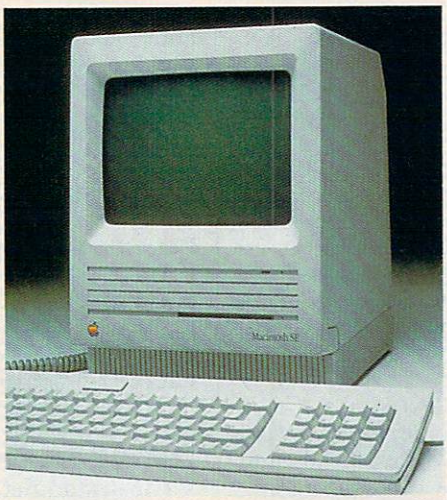
As for the MS-DOS world, it would be unfair to write about it without at least a glance over at OS/2, the much-touted new operating system that offers multitasking and access to far more memory than MS-DOS does. While OS/2 will work with all the AT-class computers described here, it will require several megabytes of memory and a computer based on the 80386 (such as the Compaq Deskpro 386/20 and the IBM PS/2 Model 80) to really unleash its power. It will also require new software, and so far, no OS/2 software has emerged that begins to justify the substantial investment required for such high-powered equipment. In short, it would be the rare home-office setting that would *demand* OS/2 now.

As it happens, you can find some 386 machines that cost less than the most expensive AT machines. The prices of 386 machines are dropping. For instance, the Dell System 310 costs about $3,500, significantly less than the IBM PS/2 Model 60 or the Compaq Deskpro 286 Model 40.

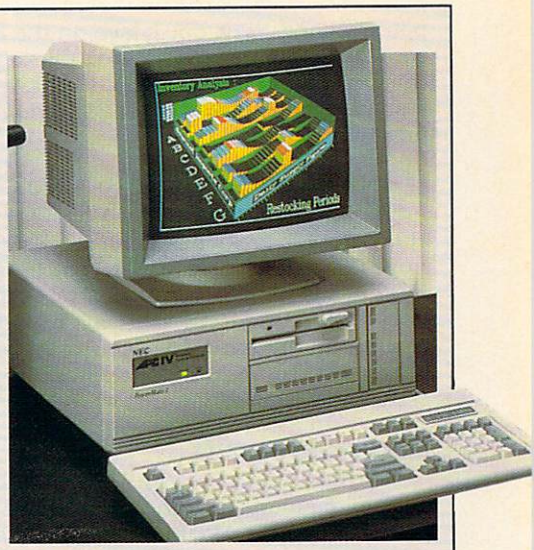
AMIGA 2000

The hot topic in MS-DOS computing today is OS/2, an

Epson Equity III+



Macintosh SE



NEC APC IV Powermate 1

operating system that allows multitasking—that's the ability to have the computer perform two or more jobs at once. The Amiga computers, introduced in 1985, have had multitasking from the start, and the 2000 is the first with enough memory to take advantage of it. Yet Amigas have never been able to find a niche in corporate America. Amigas are best suited for special-purpose applications, such as producing desktop videos and graphic presentations. The Commodore Genlock device allows you to sync computer graphics with video images.

The mouse-based Amiga 2000 has the same great color and sound as the 500, but is faster and can hold more memory (up to eight more megabytes). In addition, it has more expansion potential, thanks to its seven expansion slots. The optional Bridgeboard, for instance, allows you to run MS-DOS software (you may need an MS-DOS disk drive as well).

AST PREMIUM/286

This highly rated, very fast AT compatible features three operating speeds that can be selected from the keyboard, support for expanded memory, and superior documentation. Two of the seven expansion slots accommodate special memory expansion cards (AST calls them "FASTRAM" boards) that can add up to 4MB of high-speed memory to the system. Up to four drives can be installed internally. Also, the AST Premium/286 accepts the AST Premium FASTboard/386, which turns the computer into a "386" machine.

DELL SYSTEM 220

Should you buy a computer by mail? That depends to a large degree on who you are, and who the seller is. If you feel competent enough to do without the hand-holding offered by some (but not all) computer retailers, a phone purchase can deliver exceptional value on quality machines. And Dell Computer (formerly known as PC's Limited) has built a fine reputation for reliability and service for its impressive line of MS-DOS computers. Since Dell manufactures every computer it sells, the company describes itself as a direct-sales manufacturer.

The spanking new Dell System 220 is—on paper at least—the best value in the AT marketplace. It has good looks, good performance, and good backup service. Its key selling point is speed, running at a blistering 20 megahertz. The 220 is by far the fastest AT computer available and twice as fast as the IBM PS/2 Model 50. At the same time, the 220 is smaller than the IBM PS/2 Model 30.

The 220 supports two 3.5-inch disk drives and a 3.5-inch hard-disk drive (either 40MB or 100MB). Despite the high-storage capability, the fan is very quiet. The power requirements are low because so much of the system is integrated onto the system board and doesn't require boards or cables. VGA graphics are built-in. The Dell System Analyzer is included with the purchase, as is a one-year service contract with Honeywell-Bull. Dell OS/2 runs on the 220.

IBM PERSONAL SYSTEM/2 MODEL 50

The PS/2 Model 50 is based on the same microprocessor (the Intel 80286) as the PC AT, but adds Micro Channel bus architecture and built-in VGA display technology. Micro Channel, a high-speed data movement system, was designed to facilitate multitasking and network connectivity. VGA graphics can display up to 256 colors on-screen at once, a visual feast.

Three expansion slots (for Micro Channel compatible boards only) are available, and the memory can be expanded to a total of 7MB. Unfortunately, you cannot use any of the boards that you might have installed in an IBM PC. The Model 50 is fast, but not exceptionally fast when compared to other AT-class machines.

A single 3.5-inch disk drive, with a capacity of 1.44MB, and a 20MB hard-disk drive (with an unusually slow access speed of 80 milliseconds) are standard. A second external 3.5-inch or 5.25-inch drive can be added.

KAYPRO 286

The Kaypro 286 is built like a battleship. The large, heavy system has a 40MB hard disk, with room for a total of four drives to be mounted internally. The computer is fast, and the multipurpose video adapter can display everything up to EGA standard graphics. However, the green-screen monitor we tested had a disturbing lingering afterimage.

The system comes with *WordStar* word-processing software, the excellent *Word Finder* thesaurus, and an acceptable DOS shell program.

Kaypro likes to advertise its "Non-Obsolete Design," but rarely explains what that means. Simply put, the processing hardware is built onto an expansion board inserted in a slot. Someday, you might be able to pull out this whole system board and replace it with a more

powerful one—say, one based on the 80386 microprocessor—but that upgrade board doesn't exist today. Still, this promise of added flexibility takes nothing away from a solid, powerful AT compatible from a company known for giving value.

LEADING EDGE MODEL D2

Like its predecessor, the Model D (which is still available), the D2 looks good and works well. It's fast, with a huge 60MB hard drive and a good keyboard. (There's also a D2 available with a slower 30MB drive, which sells for about $400 less.) There are six expansion slots, but one is used by the hard-drive controller and one by the EGA graphics card, leaving four open. Leading Edge computers come with a 20-month warranty.

MACINTOSH PLUS/SE

The Macintosh Plus and SE both come with a megabyte of memory, a 9-inch black-and-white screen, and the now famous Macintosh mouse-based operating system. And they both run the same software. The SE is moderately faster than the Plus, and it includes an expansion slot. That expansion slot can accommodate some interesting upgrades, such as an MS-DOS compatibility board or a card that lets you connect a color monitor to the Mac. It can also be used to add memory.

No matter how you look at it, the Macintosh is expensive. At the same time, it is a unique and appealing system. Some of the most exciting developments in personal computing, such as *HyperCard*, are Macintosh-only products. With the recent introduction of an inexpensive MIDI connector (the standard interface for connector synthesizers and musical keyboards), interest in Mac music is heating up. And, though that gap may be closing, the graphics tools available for the Macintosh are still superior to those for MS-DOS systems.

NEC APC IV POWERMATE 1

The NEC line of AT-compatibles is widely distributed, reasonably priced, and available in configurations to suit every need. The PowerMate 1—called a "personal business computer" in some advertising—was recently enhanced by boosting the operating speed to 10MHz and its RAM capacity to more than 10MB.

ZENITH Z-286 LP

This brand-new AT compatible is extraordinarily compact but powerful. It comes standard with a fast 40MB hard disk, a 3.5-inch floppy (an external 5.25-inch drive is available as an option), and a megabyte of memory. Memory can be expanded on the system board up to 6MB (without using up expansion slots), a highly desirable feature. The video adapter supplied supports monochrome, CGA, and selected VGA modes. ■

A SAMPLING OF NATIONALLY DISTRIBUTED MODELS FROM MAJOR MANUFACTURERS

CLASSIC MACHINES

Classic machines incorporate "first-generation" computer technology, though they have been enhanced over the years.

Manufacturer Model	System Price[1]	Standard Maximum Memory[2]	Hardware Included: Disk Drive	Hardware Included: Monitor	Ports Included[3]: Audio	Joystick	Mouse	Parallel	Serial	Video	Free Expansion Slots	Software Included[4]	Warranty (Months)
Apple Computer, Inc.													
Apple IIe	$1,626	128KB/1MB	2	Mono	●	●	○	○	○	●	7	BASIC, DOS, tutorial	3
Apple IIc	$1,228	128KB/1MB	2	Mono	●	●	●	○	●	●	None	BASIC, DOS, tutorial	3
Commodore Business Machines													
Commodore 64c	$1,090	64KB/320KB	2	Color	●	●	●	○	○	●	None	BASIC, DOS, *GEOS*, *GEO-Write*, *GEO-Paint*, *QuantumLink*	3
Commodore 128D	$1,300	128KB/640KB	2	Color	●	●	●	○	○	●	None	BASIC, DOS, CP/M, tutorial	3
Tandy Corp.													
Color Computer 3	$980	128KB/512KB	2	Color	○	●	○	○	●	●	None	BASIC	3
Video Technology Computer, Inc.													
Laser 128E	$917	128KB/1MB	2	Mono	●	●	○	●	●	●	1	DOS, BASIC	3

KEY: ● = yes; ○ = no; Mono = Monochrome; [1] System price for standard configurations plus additional equipment added in order to create a system; [2] Memory that comes with the system/maximum amount of memory that can be added to the system with or without using an expansion card; [3] Additional ports may be included; [4] Additional software may be included.

MOUSE MACHINES

Mouse machines are sold with a mouse, which is used to run the computer.

Company Model	System Price[1]	Standard Maximum Memory[2]	Hardware Included[3]: Disk Drive	Hardware Included[3]: Monitor	Ports Included[4]: Audio	Joystick	MIDI	Mouse	Parallel/Printer	Serial	SCSI	Video	Free Expansion Slots	Software Included[5]	Warranty (Months)
Apple Computer, Inc.															
Apple IIGS	$1,826	512KB/8MB	2	Mono	●	●	○	●	○	●	○	●	8	BASIC, System, tutorial	3
Apple Computer, Inc.															
Macintosh Plus	$2,198	1MB/4MB	2	Mono	●	●	○	●	●	●	○	N/A	None	*HyperCard*, *MultiFinder*, System, tutorial, utilities	3
Macintosh SE	$2,898	1MB/4MB	2	Mono	●	○	○	●	●	●	○	N/A	1	*HyperCard*, *MultiFinder*, System, tutorial, utilities	3
Atari Corp.															
Atari 1040ST	$1,300	1MB/4MB	2	Mono	●	●	●	●	●	●	○	●	None	BASIC, DOS, *GEM*, utilities	3
Atari Mega-ST	$1,995	2MB/2MB	2	Mono	●	●	●	●	●	●	○	●	None	BASIC, DOS, *GEM*, utilities	3
Commodore Business Machines															
Amiga 500	$1,400	512KB/1MB	2	Color	●	●	○	●	●	●	○	●	1	BASIC, DOS, *KickStart* utilities, *Workbench*	3
Amiga 2000	$2,595	1MB/9MB	2	Color	●	●	○	●	●	●	○	●	7	BASIC, DOS, *KickStart* utilities, *Workbench*	3

KEY: ● = yes; ○ = no; Mono = Monochrome; MIDI = Musical Instrument Digital Interface; SCSI = Small Computer Systems Interface; [1] System price for standard configurations plus additional equipment added in order to create a system; [2] Memory that comes with the system/maximum amount of memory that can be added to the system with or without using an expansion card; [3] Mouse is included; [4] Additional ports may be included; [5] Additional software may be included.

CHARTS COMPILED BY STEVEN C. M. CHEN

IBM AT COMPATIBLES (80286 MICROPROCESSORS)

Company Model	System Price[1]	Standard System Memory[2]	Hardware Included: Floppy-Disk Drives[3]	Hard-Disk Drive Capacity/ Access Speed	Monitor	Ports Included[4]	Free Expansion Slots	Micro-processor Speed (MHz)	Wait State (Cycles)	Software Included[5]	Warranty (Months)
AST Research, Inc.											
AST Premium/286 Model 140	$4,290	1MB/4MB	1	40MB/28 ms	Mono	P, S, eEGA	6 AT, 1 PC	6/8/10	0	GW, DIA, DC, DOS	12
Blue Chip Electronics, Inc.											
MasterPC 286-12	$1,829	1MB/1MB	1	40MB/40 ms	Mono	P, S, MG/CGA	4 AT	6/10/12	1	GW, DOS	12
Dell Computer Corp.											
Dell System 220	$2,499	1MB/8MB	1[6]	40MB/29 ms	Mono	P, S	3 AT	8/20	1	GW, DIA, DOS	12
Epson America, Inc.											
Epson Equity II Plus	$3,093	640KB/640KB	1	40MB/28 ms	Mono	P, S, MG	3 AT, 3 PC	8/10	1	GW, DIA, DOS	12
Epson Equity III Plus	$3,793	640KB/640KB	1	40MB/28 ms	Mono	P, S, MG	7 AT, 2 PC	6/8/12	1	GW, DIA, DOS	12
Hyundai Electronics America											
SUPER-286c	$1,999	640KB/1MB	1	30MB/65 ms	Mono	P, 2 S, eEGA	4 AT, 2 PC	8/10	1	GW, DIA, DOS	18
IBM Corp.											
IBM PS/2 Model 50-021	$3,965	1MB/1MB	1[6]	20MB/80 ms	Mono	P, S, M, VGA	3 MC-16B	10	1	GW, DIA, DOS	12
Kaypro Corp.											
KAYPRO 286	$2,995	1MB/1MB	1	40MB/32 ms	Mono	P, S, eEGA	2 AT, 3 PC	6/12	1	GW, DOS[7]	12
Leading Edge Hardware Products, Inc.											
Leading Edge Model D2	$1,995	640KB/1MB	1	30MB/60 ms	Mono	P, S, eEGA	4 AT, 2 PC	6/8/10	1	GW, DIA, DOS, LE WP	20
Leading Edge Model D2	$2,495	640KB/1MB	1	60MB/28 ms	Mono	P, S, eEGA	4 AT, 2 PC	6/8/10	1	GW, DIA, DOS, LE WP	20
NEC Information Systems, Inc.											
NEC APC IV PowerMate 1	$3,869	640KB/640KB	1	40MB/40 ms	Mono	P, S, EGA	5 AT, 1PC	8/10	1	GW, DIA, DOS	12
NEC APC IV PowerMate 2	$4,369	640KB/640KB	1	40MB/40 ms	Mono	P, 2 S, EGA	6 AT, 2 PC	8/10	1	GW, DIA, DOS	12
Tandy Corp.											
Tandy 3000	$3,849	640KB/640KB	1	40MB/28 ms	Mono	P, S, MG/CGA	7 AT, 2 PC	6/12	1	GW, *Deskmate II*, DOS	12
Tandy 3000 HL	$3,349	512KB/640KB	1[8]	40MB/28 ms	Mono	P, MG/CGA	3 AT, 4 PC	4/8	1	GW, *Deskmate II*, DOS	12
Zenith Data Systems											
Z-286	$3,298	512KB/512KB	1	20MB/65 ms	Mono	P, S, eEGA	3 AT, PC	8	1	DIA, DOS, *MS Windows*	12
Z-286 LP	$3,299	1MB/6MB	1[6]	40MB/28 ms	Mono	P, 2 S, VGA	2 AT	8	0	DOS, *MS Windows*	12

KEY: AT = 8/16-bit expansion slot; CGA = Color Graphics Array; DC = disk caching; DIA = Diagnostics; eEGA = enhanced EGA (also supports monochrome graphics); EGA = Enhanced Graphics Adapter; GW = GW-BASIC; LE WP = Leading Edge Word Processor; M = pointing device port for the new IBM Personal System/2 Mouse; MC = Micro Channel slot; MCGA = Multi-Color Graphics Array; MG = Monochrome Graphics (Hercules-graphics compatible); Mono = Monochrome; MS = Microsoft; ms = millisecond; P = parallel port; PC = 8-bit expansion slot; S = serial port; VGA = Video Graphics Array

[1] System price for standard configurations plus additional equipment added in order to create a system; [2] Memory that comes with the basic system and/or maximum amount of memory that can be added to the motherboard without using an expansion board; [3] 1.2MB 5.25-inch floppy-disk drive, except where noted; [4] Additional ports may be included; [5] Additional software may be included; [6] 1.44MB 3.5-inch floppy-disk drive; [7] Also includes *WordStar Professional 4.0, Word Finder, SpeedStor*; [8] 360KB 5.25-inch floppy-disk drive.

IBM PC COMPATIBLES (8086/8088 MICROPROCESSORS)

Company Model	System Price[1]	Standard System Memory[2]	Hardware Included: Floppy-Disk Drives 5.25-inch	Floppy-Disk Drives 3.5-inch	Monitor	Ports Included[3]: AUDIO	JOYSTICK	MOUSE	PARALLEL	SERIAL	VIDEO	Free Expansion Slots	Micro-processor Speed (MHz)	Software Included[4]	Warranty (Months)
Amstrad															
Amstrad PC1640 DDM	$999	640KB/640KB	2		Mono	○	●	●	●	●	eEGA	3	8	DOS, *GEM Desktop, GEM Paint*, GW	3
Blue Chip Electronics															
Blue Chip pcPopular 2	$939	512KB/640KB	2		Mono	○	●	●	●	●	MG/CGA	1	4.77/8	DOS, GW, *GO!*	12
Commodore Business Machine															
Commodore PC 10-2	$1,348	512KB/640KB	2		Mono	○	○	○	●	●	MG/CGA	5	4.77	DOS, GW, *Sidekick*	12
Dell Computer Corp.															
Dell System 100	$1,069	640KB/640KB		2	Mono	○	○	○	●	●	MG	2	4.77/9.54	DOS, GW Microsoft *Works*	12
Epson America, Inc.															
Epson Apex	$1,029	512KB/640KB	2		Mono	○	○	○	●	○	CGA	2	4.77/8	DOS, DIA, GW *pfs: First Choice*	12
Epson Equity I Plus	$1,444	640KB/640KB	2		Mono	○	○	○	●	●	CGA	5	4.77/10	DOS, DIA, GW	12
Hyundai Electronics America															
Super-16T	$1,099	640KB/640KB	2		Mono	○	○	○	●	●	MG/CGA	6	4.77/8	DIA, DOS, GW[5]	18
IBM Corp.															
IBM PS/2 Model 25	$1,640	512KB/640KB		2	Mono	●	○	●	●	●	MCGA	2	8	DOS, BASIC	12
IBM PS/2 Model 30-002	$2,065	640KB/640KB		2	Mono	●	○	●	●	●	MCGA	3	8	DOS, BASIC	12
Kaypro Corp.															
Kaypro PC	$1,595	768KB/768KB	2		Mono	○	○	○	●	●	eEGA	6	4.77/10	DOS, GW[6]	12
Leading Edge Products															
Leading Edge Model D	$995	512KB/768KB	2		Mono	○	○	○	●	●	MG/CGA	4	4.77/7.16	DOS, GW, LE WP	20
Tandy Corp.															
Tandy 1000 EX	$1,248	256KB/640KB	2		Color	●	●	○	●	○	CGA	2	4.77/7.16	DOS, GW, PD	3
Tandy 1000 HX	$1,268	256KB/640KB		2	Color	●	●	○	●	○	CGA	3	4.77/7.16	DOS, GW, PD 2	3
Tandy 1000 SX	$1,418	384KB/640KB	2		Color	●	●	○	●	○	CGA	5	4.77/7.16	DOS, GW, PD II	3
Tandy 1000 TX[8]	$1,768	640KB/768KB		2	Color	●	●	○	●	●	CGA	5	4/8	DOS, GW, PD 2	3
Vendex															
Vendex Turbo HeadStart 888-XT	$995	512KB/768KB	2		Mono	○	●	●	●	●	MG/CGA	7	4.77/8	DOS, GW[7]	12

KEY: ● = yes; ○ = no; CGA = Color Graphics Array; DIA = Diagnostics; eEGA = enhanced EGA (also supports monochrome graphics); EGA = Enhanced Graphics Adapter; GW = GW-BASIC; MCGA = Multi-Color Graphics Array; MG = Monochrome Graphics (Hercules-graphics compatible); Mono = Monochrome; PD = Personal Deskmate

[1] System price for standard configurations plus additional equipment added in order to create a system; [2] Memory that comes with the basic system and/or maximum amount of memory that can be added to the motherboard without using an expansion board; [3] Additional ports may be included; [4] Additional software may be included; [5] Also includes *Electric Desk Alpha Software*; [6] Also includes *WordStar 4.0* and *Word Finder*; [7] Also includes database, spreadsheet, and word processor; [8] Has 80286 microprocessor.

MANUFACTURERS' INFORMATION

AMSTRAD, (214) 297-4898; AST RESEARCH, (714) 863-1333; APPLE COMPUTER, INC., (408) 973-2222; ATARI CORP., (408) 745-2000; BLUE CHIP ELECTRONICS, (602) 961-1485; COMMODORE, (215) 431-9100; COMPAQ, (713) 370-0670; DELL COMPUTER, INC., (512) 338-4400; EPSON, (213) 539-9140; HYUNDAI, (408) 986-9800; IBM CORP., (800) 447-4700; KAYPRO, (619) 481-4300, (800) 4-KAYPRO; LEADING EDGE, (617) 828-8150, (800) USA-LEAD; NEC, (617) 264-8000; TANDY, (817) 390-3700; VENDEX, (516) 773-3062; VIDEO TECHNOLOGY, (312) 272-6760; ZENITH, (312) 699-4800, (800) 842-9000

Wave Typographers

Discover How This Typesetter Tamed Technology and Freed Up His Employees, Saving Money and Time

BY LYNIE ARDEN

Some people might think that owning a condo near a Southern California beach is success in itself. And they might be right. Others might think that owning a typesetting business with clients in several states and gross receipts of more than a million dollars is surely success realized. They might be right, too. Just such a real-life scenario belongs to Pete Thomas, who owns and operates Wave Typographers from his beachside condominium in Ventura, California. Thomas says this is only the beginning.

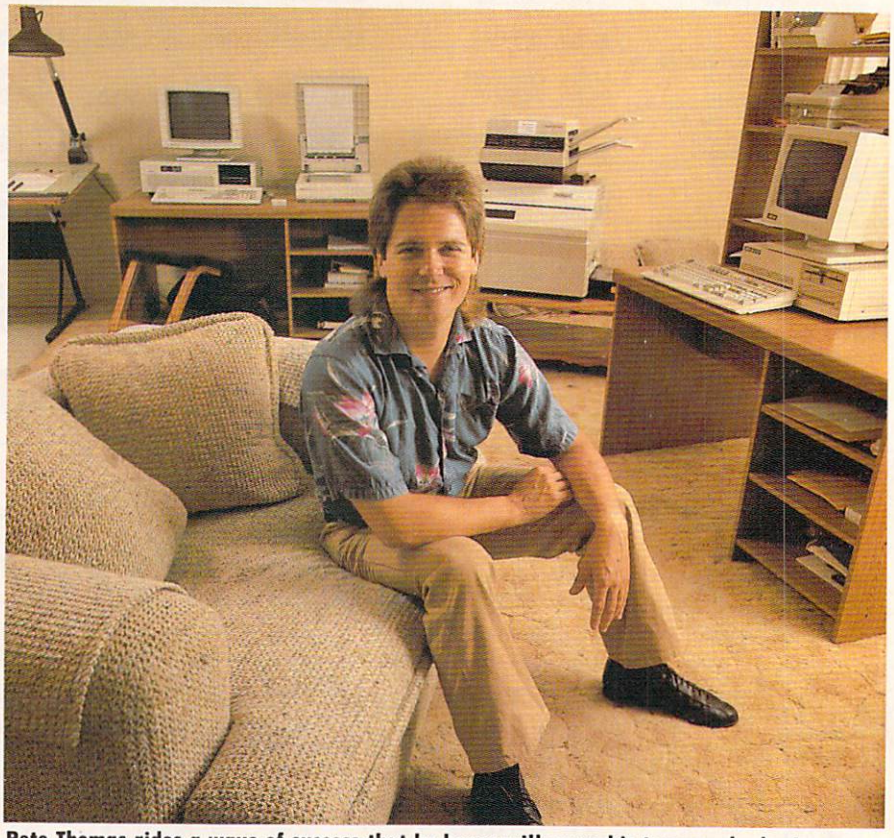
"I've been preparing for this for a long time," reflects Thomas, who was introduced to the typesetting industry in his hometown of Dayton, Ohio, in 1970. "I started as an apprentice for the *Dayton Journal Herald*, right out of high school. That's where I learned the hands-on side of the business. At the same time, I attended college, where I earned a degree in marketing."

By the time he finished college, Thomas knew he wanted a business of his own. He spent 10 years preparing. He began by managing print shops, then developing a multimillion-dollar typesetting department for a large corporation, and, finally, franchising a typesetting business throughout Ohio.

"I'm not some graduate straight out of business school who decided typesetting would be a good way to make a lot of money. I slugged it out in the trenches, and now I know this industry from every angle."

The entrepreneurial dream became a reality in 1985 with the start-up of Wave Typographers. Right from the start, innovative thinking led the way. The company was structured in a service-bureau format.

"The service bureau concept is nothing new," explains Thomas, "but it has never been applied to the typesetting industry. It makes sense, though, because this is an industry that is constantly in a state of flux. Employees never know how much work to expect, and, consequently, turnover is quite high. At the same time, employers are always fighting the battle of the work flow. What's needed is some way to smooth out the peaks and valleys. I thought a service bureau could act as that kind of equalizer."



Pete Thomas rides a wave of success that he hopes will carry his typography business across the country.

Wave Typographers hires independent home-based typesetters who can use their own equipment without learning specialized typesetting codes.

"Any experienced typesetter new to our network can use whatever computer and software he or she owns to start work immediately," says Thomas. "Part of our strength lies in utilizing any expertise a typesetter has."

Within the typesetting industry there are many vendors with different equipment and different codes. An individual typesetter might be familiar with one or two systems. Ordinarily, if he or she moves to another company with a different system from the one used by the former company, it might take three to six months to get up to a good productivity level. But Wave Typographers is equipped with four computers, an extensive software library, plus the base typesetting machine, a Verityper VT600. A core group of four employees—well versed at using all these hardware and software tools—will take files from different systems and make them work in the Verityper.

PHOTOGRAPH BY MARK MILLER

Contributing editor LYNIE ARDEN *wrote "Home-Based Franchises" in the May issue.*

PRODUCTIVITY FROM HOME

Home-based typesetters have been common for many years, but they have generally been within driving distance of their employers, so they can pick up and return work within a relatively short period of time. Wave Typographers uses facsimile machines and modems instead of cars and gas. "People who want to work at home are different. Many want to enjoy more of life than their urban commutes. Well, now they can, no matter where they live. This freedom has created an environment that maximizes productivity."

Thomas also maximizes productivity by utilizing workers' talents. While they work, most typesetters enter text and embed codes; these two functions are separated at Wave Typographers. "Using a typesetter for text input is a mistake. When I get a multiple-page job, I put a word processor on it, and the typesetter comes in later and spends a couple of minutes per page just dropping in codes. A good typesetter is a valuable commodity. Why waste that on simple typing? Instead of needing three typesetters, I only need one typesetter and two word processors. Because they are doing only what they do best, they both make more money."

COMPETITIVE PRICING

How does the customer fare under the Wave Typographers system? "The customer gets the benefit of extremely competitive prices. Part of this is due to my lack of overhead. It also comes from my unique pricing system.

"Normally, typesetters set hourly rates for their work. You can go to the same typesetting service several times with the same job, and it will cost you different amounts each time. Why? Because one time a new operator took three hours to get it done, and the next time a pro of many years did it in half an hour. So one time it cost you $200, and the next time it was $50—for the same job! I compiled a price list based on dimensions. An 8.5-inch-by-11-inch piece of paper is priced the same whether it is full of complicated text or just has a few big blocks. It all comes out in the wash. The burden is on us to meet that fixed price, not on the customer.

"It's fantastic that we can serve people on both sides of the fence at the same time. Our clients get good prices, and at the same time our operators are earning $10 to $20 an hour. Everybody's happy, and that makes me happy.

BLUEPRINT FOR SUCCESS (à la Pete Thomas)

1. Take the time to learn. Learning everything about your business from the ground up is very important. Successful business owners read books and trade publications, attend seminars, and exchange information with colleagues.

2. Use technology to reduce overhead. Your computer is a productivity tool. Stay on the lookout for new software that will save you time and effort.

3. Provide good service. Customers place a high value on service. Not even lower prices can lure a customer away from a company that offers good service.

4. Offer a free sample. This is a tried and true marketing method. It is a simple way to prove to a prospective customer that your product or service is of the quality that you claim it is.

5. Look for new ways to do things. Don't let routine or tradition keep you from thinking creatively. Just because "it's always been done this way" doesn't mean there isn't a better way.

INNOVATIVE TECHNOLOGY

"The trick is to enslave technology instead of people. A lot of people are really scared to try something new," says Thomas. "Not me. I go to COMDEX [the large computer trade show], I'm always on the lookout for new software to make the job easier, and I have programmers develop what I can't find elsewhere."

For instance, most typography companies have a pool of proofreaders assigned to each typesetter. Not only does it cost money to pay the proofreaders, but it slows down the process as well. "I've eliminated a tremendous part of my overhead by cutting down on the number of proofreaders that I need. How? I found a piece of software called *PC Typewrite* that operates a 100,000-word dictionary and capitalization checker."

Wave Typographers is also producing original software. One of its recent developments is *GORESUME*, an easy-to-use, menu-driven resume writer. This software is free to anyone who cares to download it from electronic bulletin boards. Why make it available to anyone who wants it for free?

"My whole theory is based on having operators everywhere cranking work through my typesetting equipment. This is just one way of making that happen. What I'm doing in this case is encouraging individual word processors who do resumes to send their work through my equipment for only $5 a page. That's a fraction of the cost of going somewhere else. Plus, with *GORESUME*, it shouldn't take as much time to prepare resumes in the first place."

Giving away software is typical of the way Wave Typographer's services are marketed. A sales presentation is an exercise in "what you see is what you get." While talking to a prospective customer, Thomas takes an actual one-page job order and faxes it to one of the typesetting operators. He keeps talking while the operator does the work and sends it to the home office, where it is typeset on the Varityper. It is then faxed back to Thomas (at the client's office) in finished form. "Most of the time that seals the deal right then and there.

"Service combined with price is an unbelievable mix. I've optimized that as much as anyone possibly can. Not only do my customers get the best price in town, but they can have what I call 'Same Day Executive Service.' Same-day service is almost unheard of in this industry—but service is the name of the game. I must produce work on demand, and I can do that with the Wave network."

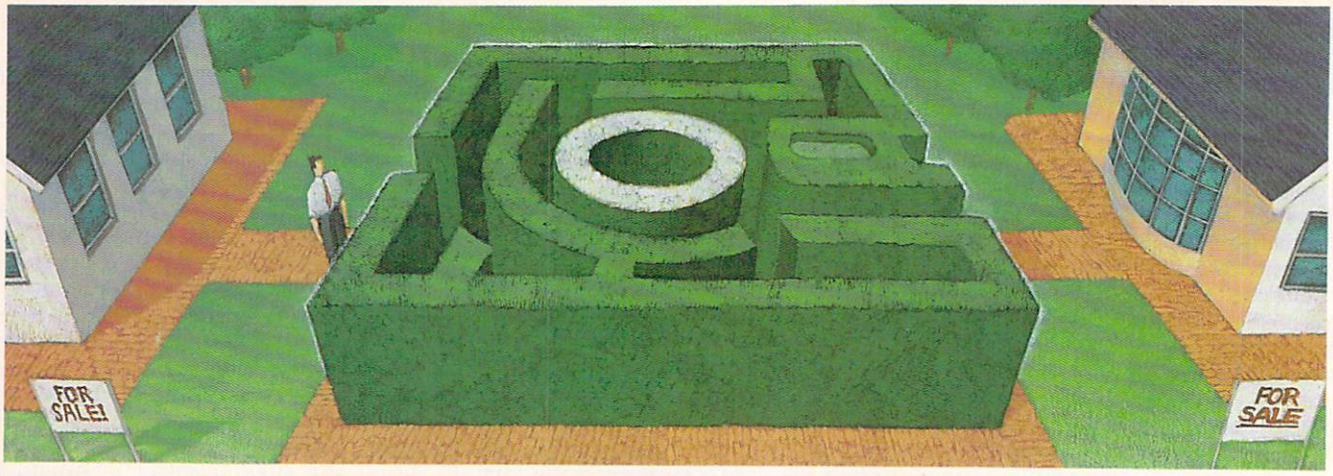
FUTURE WAVE

What's the wave of the future? "I want to have the first truly national typesetting company. I want hundreds of typesetters all over the country working through Wave's network. I envision being able to take very large projects and distribute the work among 50 or 60 operators. Imagine having a book typeset in a single day!

"America is in the 'I-want-it-now' mode. There is nothing preventing us from meeting that challenge. The traditional typesetter can't, he or she's not equipped. But with a whole group of operators set up with the proper equipment and telecommunications supports, a lot of time lag can be eliminated."

How does Thomas gauge his success? "Success to me is seeing a lot of happy people around. Workers are happy when they are able to realize their potential. They can do that by being in a business relationship with me rather than being an employee of mine. Customers are happy when they receive good service and value for their dollars. After that, everything else comes, the money and all.

"The condo. The beach. The money. It's great. But other people have dreams, too. They might want to have time to hunt and fish and hike and still make enough money to live comfortably. Treating people fairly. That's what it's all about." ■



Making Successful Financial Decisions with a Spreadsheet

BETTER WAYS TO SELL YOUR OLD HOME AND BUY A NEW ONE

Plus: How to Calculate the Interest on Any Deposit or the Cost of Any Loan

BY ROB KRUMM

If you've ever shopped for a new home while selling your old home, you know how convoluted the process can become. Typically, you don't want to make an offer for a new place until someone has given you a down payment and signed a contract to buy your old place. In addition, you can't truly know when you'll close the sale until you draw up the sales contract, yet until you know that date, locking in an interest rate for your new mortgage becomes problematic. You often can't tell how much of a new mortgage you'll even need (or how costly a new home you can afford) until you see how much money you'll realize from selling the old home—which you won't know for certain until someone gives you a down payment. Considering all the mutually dependent factors (only some of which I mentioned), it's amazing that homes ever are bought and sold.

But, of course, they are. As a financial problem becomes more elaborate, a worksheet model created with a spreadsheet can be a great tool for working through tough scenarios. The danger, however, is that the worksheet itself can become as elaborate as the predicament. Just as a circular relationship is established between your need to sell one home before proceeding to buy another, so a circular relationship is frequently set up in a worksheet for figuring out this type of quandary.

This month, we'll look at a circular relationship—more properly called a "circular reference"—in the light of a common financial situation: selling one home and buying a new one. We'll see how you can take advantage of a special feature called "iteration" found in most spreadsheets to resolve the apparent knotty contradictions set up when several conditions are mutually dependent.

Last month, ROB KRUMM *demonstrated two ways that spreadsheets can help make your transactions more effective when borrowing and lending money.*

WHY YOU NEED TO COUNT IN CIRCLES

To indicate their view of the world, alchemists in the Middle Ages used a special symbol—a serpent wound into a circle eating its own tail. There are some everyday financial problems that bring this tail-chasing symbol to mind. One problem came my way early this year, a few months after the Wall Street crash when the housing market was very unstable. The example required a special type of spreadsheet calculation called an *iteration*, from the Latin word *iterum*, which means *again*.

The situation involved a worksheet being developed by a salesperson named Charles P. who was moving his family from New York to Chicago. Most of the worksheet involved such basic arithmetic operations as addition and multiplication. Because he was entering into a risky new venture, Charles hoped to pay less than $600 each month for housing, so he compared the costs of three types of mortgages: 30-year fixed, 15-year fixed, and 5-year variable. The two main numbers Charles entered as he went along were the selling price of his old home and the buying price of the new one. But there was one particularly tricky section. Let's look at his worksheet in figure 1.

Charles began by subtracting his outstanding mortgage from the selling price of his old home. This gave him a gross profit of $147,000 before taxes and various fees. Then Charles estimated those taxes and fees, which included the "points" he would pay a bank for his new mortgage and

ILLUSTRATION BY DARRYL LIGASAN

the extra federal and state income tax he would owe because he was planning to buy a new home that cost less than his old home. These steps helped him compute how much money he would retain from the sale of his place in New York—his "net profit" in the worksheet—and have available as a down payment for his new home.

However, Charles originally had difficulties with two elements. To compute his net profit of $106,287, he subtracted the points, taxes, and fees from his gross profit. Then, to judge how much he would need for a new place, he estimated $150,000 as the buying price for a home in Chicago and subtracted his net profit from that price to arrive at a $43,713 mortgage.

Here's where his calculations became mutually dependent. When you buy a new home that costs less than the sale price of your old home, the Internal Revenue Service basically says that you owe tax on no more than the difference between the price of your old and your new homes (minus such selling expenses as a realtor's fee). But Charles could not calculate how much income tax he would owe until he knew how much he was going to pay for a new home. Yet he could only estimate how much he would pay for his new home until he saw how much profit he would net from selling his old home.

Furthermore, in order to arrive at a $106,287 net profit, Charles had to estimate how much he would pay in points on the mortgage for his new home. Points, also called *origination fees*, are calculated by percentages—each point paid on a mortgage equals one percent of the amount of the mortgage. After speaking with several bankers, Charles figured on paying 2.5 points. The formula in the spreadsheet for points is simple *(see figure 2)*: the new mortgage multiplied by 2.5 percent.

But wait a minute. In order to figure the size of the new mortgage, Charles needs to know his net profit. And in order to figure his net profit, he needs to know how much he'll pay in points. Yet in order to figure how much he'll pay in points, he needs to know the size of his new mortgage! The process seems to go around in a circle in which a value used to calculate another value is itself dependent on the calculated value. How do you ever untangle that?

Figure 2 shows how these relationships can be expressed as spreadsheet formulas. A circular relationship is formed between the formulas for points (cell B13), net profit (B15), and mortgage amount (D4). Any increase in the mortgage increases the points, which in turn decreases the net profit, which then increases the mortgage—in continual circles like the snake eating its tail.

RESOLVING THE SEEMING CONTRADICTIONS OF MUTUAL DEPENDENCY

When you enter a series of formulas like these into a spreadsheet, you create a circular reference. Most programs display a warning to indicate that such a relationship exists. In Lotus *1-2-3*, the message CIRC appears at the bottom of the screen; in Microsoft *Excel*, a dialog box pops up.

There are two types of circular references: *diverging* and *converging*. Diverging references are usually entered by mistake. The most common case is a total that includes itself. Try the following example with your own spreadsheet. Enter the number 1 in cell A1, enter 2 in cell A2, and enter 3 in cell A3. Then, using *1-2-3* or a compatible, enter the function *@SUM(A1..A4)* into cell A4, which totals the numbers in cells A1 to A4. With Excel, enter the function *=SUM(A1:A4)* into cell A4. (Check your spreadsheet's documentation for the exact syntax of its SUM() function.) Each time you recalculate this worksheet, the value in cell A4 will increase by 6 (the sum of the numbers in cells A1, A2, and A3). This is a diverging reference because each recalculation moves further away from a resolution; it's not useful and should be removed.

A converging reference is a different beast. Here the imbalance caused by the circular reference is decreased each time a recalculation takes place, which moves you closer to a solution. The circular reference in our example of selling and buying homes is a converging reference. Each time Charles calculated, the value for "points" became smaller. He saw that after 10 complete calculations, the amount of additional money paid for points was so small that it was no longer significant. When you are talking about money, you can stop when the difference between one calculation and the next is less than .01 or, if you're figuring approximate dollars as in this example, less than $1.

Problems that contain converging references can be resolved by recalculating the spreadsheet a number of times. The process of repeated recalculation is called *iteration*.

One way to resolve a converging reference is to manually perform the calculate command several times; for instance, repeatedly press F9 in Lotus *1-2-3*. But most major spreadsheets give you a means to specify the number of recalculations—that is, iterations—that should be performed with each calculate command. In *1-2-3*, the /W(orksheet) G(lobal) R(ecalculation) I(teration) command allows you to set the number of iterations from 1 to 50. Lotus *1-2-3* is automatically set to a default value of 1 iteration. By changing the default value, you cause the program to perform a series of recalculations each time a single calculation begins. When using *1-2-3*, you simply make a guess about the number of recalculations needed to resolve a circular reference. Typically,

	A	B	C	D
1	SELLING & BUYING A HOME			
2				
3	Selling price	225,000	Buying price	150,000
4	Outstanding mortgage	78,000	Mortgage amount	43,713
5			30-year fixed/month	376
6	Gross profit	147,000	15-year fixed/month	463
7			5-year variable/month	380
8	Realtor's fee	13,500		
9	Federal/State income tax	22,620	Property tax	2,000
10	Lawyer's fee	2,000	Deductible state income tax	3,000
11	Closing fees	1,000	Property tax/month	167
12	Other fees	500		
13	Points new mortgage (2.5)	1,093	30-year & tax/month	543
14			15-year & tax/month	630
15	Net profit	106,287	5-year & tax/month	547

Figure 1: Charles P.'s worksheet contains such mutually dependent factors as his net profit (cell B15), the amount of his new mortgage (D4), and points paid on that mortgage (B13).

	A	B	C	D
1	SELLING & BUYING A HOME			
2				
3	Selling price	=225000	Buying price	=150000
4	Outstanding mortgage	=78000	Mortgage amount	=D3-B15
5			30-year fixed/month	=D4/1000*8.6
6	Gross profit	=B3-B4	15-year fixed/month	=D4/1000*10.6
7			5-year variable/month	=D4/1000*8.69
8	Realtor's fee	=B3*6%		
9	Federal/State income tax	=(B3-(B8+B10+B11+B12)-D3)*39%	Property tax	=2000
10	Lawyer's fee	=2000	Deductible state income tax	=3000
11	Closing fees	=1000	Property tax/month	=D9/12
12	Other fees	=500		
13	Points new mortgage (2.5)	=D4*2.5%	30-year & tax/month	=D5+D11
14			15-year & tax/month	=D6+D11
15	Net profit	=B6-SUM(B8:B13)	5-year & tax/month	=D7+D11

Figure 2: Here are the formulas behind the worksheet in figure 1. Note the circular relationship mentioned above: Mortgage multiplied by 2.5 percent equals points (cell B13). Points (and other costs) subtracted from gross profit equals net profit (B15). Net profit subtracted from buying price equals mortgage (D4).

CALCULATE INTEREST AND LOAN PAYMENTS WITH YOUR OWN FORMULAS

Most of the newer spreadsheets or new versions of existing spreadsheets supply a full array of such financial functions as PMT() or monthly payment, FV() or future value, and PV() or present value. In last month's article on spreadsheets, we saw how useful these functions are when figuring the costs and gains from borrowing and lending money.

However, if your spreadsheet program does not have these functions built-in, you can achieve the same results by creating mathematical formulas of your own. The best way to see how these formulas work is to boot up your own spreadsheet and try the examples given below.

A FORMULA FOR MONTHLY LOAN PAYMENTS

As in last month's article, the PMT() function is used to calculate the monthly payment needed for a loan when you already know the amount of the loan (also called principal), the interest rate (expressed as an annual rate), and the number of monthly payments. You can calculate what your monthly payment would be on any loan even if you don't have a PMT() function by implementing the following formula:

$$\text{Principal} * \frac{\text{(Interest/12 months)}}{1-(1+\text{Interest/12 months})\wedge-(\text{Period})}$$

If you were to write this same formula on one line (as you would do in a spreadsheet cell), it would look like this:

Principal * ((Interest/12)/(1−(1+Interest/12)∧−(Period)))

Note that the value for period—which is used as an exponent—is a negative value. Also note that the interest rate, which typically is an annual rate, is divided by 12 to get the effective monthly rate. This is done because the period of the loan is also stated in months, and the two items (rate and period) must match. Finally, when constructing this formula, don't forget to put in all the parentheses as indicated below. In the worksheet example shown in figure 3, the values for the $4,500 loan are stored in the following cells:

Principal (or amount borrowed): cell B4

Interest rate (divided by 12 to get effective monthly rate): cell B5

Period (expressed in months): cell B6

Now let's substitute these cell references for the words in the one-line formula above. Here, then, is how you would write the formula in your own spreadsheet to calculate the monthly payment on a loan:

B4 * ((B5/12)/(1−(1+B5/12)∧−B6))

A FORMULA FOR INTEREST GAINED ON DEPOSITS

If you want to make money by depositing it into a bank account, a spreadsheet's future value function, called FV(), can help you figure out how much you'll make. As with the PMT() function, you need to know the principal (or how much you'll deposit), the interest rate you'll gain on the deposit, and the period of the deposit.

Just as you would pay the bank $207.13 each month for 24 months if you borrowed $4,500 at 9.75-percent interest, let's see how much you would gain by depositing the same $207.13 each month for 24 months in a savings account that pays 6-percent interest. Even if your spreadsheet does not offer a FV() function, you can substitute the following formula:

$$\text{Principal} * \frac{(1+\text{Interest/12 months})\wedge\text{Period}-1}{\text{(Interest/12 months)}}$$

If you were to write this same formula on one line (as you would do in a spreadsheet cell), it would look like this:

Principal * ((1+Interest/12)∧Period−1)/(Interest/12)

Note that the value for period is expressed as an exponent. Also note again that the interest rate, which is usually an annual rate, is divided by 12 to get the effective monthly rate since the period of the deposit is also expressed in months, and the two items must match. Finally, when constructing this formula, don't forget to put in all the parentheses as indicated below. In the worksheet in figure 3, the values for the loan are stored in the following cells:

Principal (or amount deposited each month): cell D4

Interest rate (divided by 12 to get effective monthly rate): cell D5

Period (expressed in months): cell D6

Now let's substitute the cell references for the words in the one-line formula above. Here is how you would write the worksheet formula to calculate the total gain on equal monthly deposits into a savings account:

D4 * ((1+D5/12)∧D6−1)/(D5/12)

By understanding how to analyze such questions as the cost of a loan or the gain on a deposit, you'll achieve greater control over your financial life.

	A	B	C	D
1	Loan & Deposit			
2				
3		Loan		Deposit
4	Principal	4,500	Principal	207.13
5	Interest rate	9.75%	Interest rate	6.00%
6	Period (in months)	24	Period (in months)	24
7				
8	Payment, PMT function	207.13	Total gained, FV function	5,267.72
9				
10	Payment, with formula	207.13	Total gained, with formula	5,267.72

Figure 3a: A spreadsheet's PMT() function can calculate the payments on any loan. The FV() function can calculate the future value (interest plus principal) of regular deposits.

	A	B	C	D
1	Loan & Deposit			
2				
3		Loan		Deposit
4	Principal	=4500	Principal	=207.13
5	Interest rate	=0.0975	Interest rate	=0.06
6	Period (in months)	=24	Period (in months)	=24
7				
8	Payment, PMT function	=PMT(B5/12,B6,-B4)	Total gained, FV function	=FV(D5/12,D6,-D4)
9				
10	Payment, with formula	=B4*((B5/12)/(1-(1+B5/12)^-B6))	Total gained, with formula	=D4*((1+D5/12)^D6-1)/(D5/12)

Figure 3b: Here are the formulas behind the worksheet in figure 3a. Note especially cells 8 and 10 in columns B and D. The formula in cell B10 can substitute for the payment function—PMT()—in B8, just as the formula in D10 can substitute for the future value function—FV()—in D8.

after 10 iterations your references should converge; if not, the formula is probably written incorrectly.

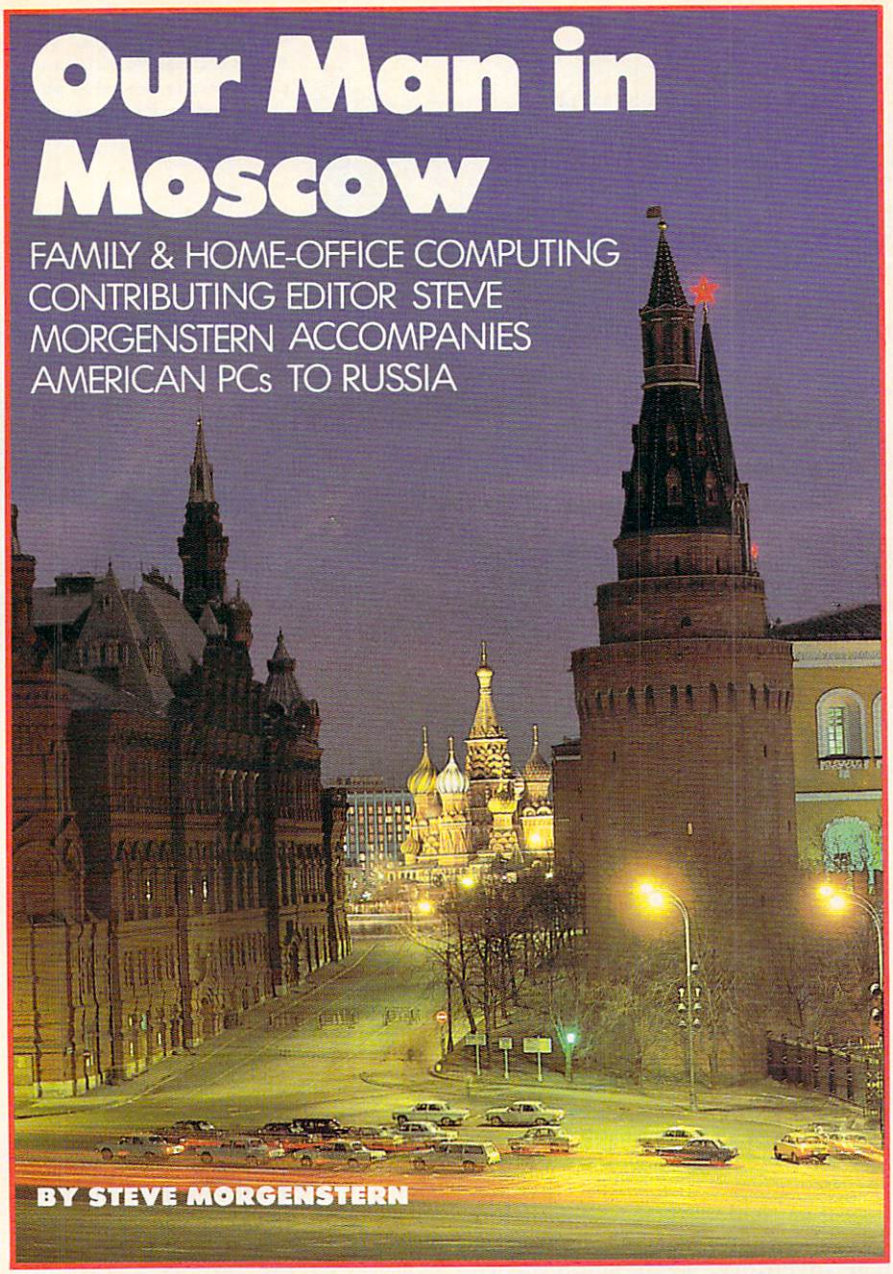
Other spreadsheets use different approaches to iteration. For example, *Multiplan* requires that you enter a formula into a cell that indicates the minimum change required for each iteration. Thus, if you enter DELTA<.01, *Multiplan* would stop the iteration when the changes with each calculation in your target cell become less than .01 (one cent). This system is a bit more complicated, but it avoids guesswork at the number of iterations needed.

WHY SPREADSHEETS ARE BETTER THAN CALCULATORS

As with other financial calculations, Charles might have been able to solve this problem with a calculator. But what's significant about the spreadsheet is that it can build iterative calculations into a large or complex worksheet that will automatically resolve all of the circular references. Iteration illustrates another advantage of model building with spreadsheets: the ability to repeatedly recalculate without making changes. When you have several elements in a financial situation that depend on each other, a spreadsheet will help you make the needed connections among all the elements. ■

Our Man in Moscow

FAMILY & HOME-OFFICE COMPUTING CONTRIBUTING EDITOR STEVE MORGENSTERN ACCOMPANIES AMERICAN PCs TO RUSSIA



BY STEVE MORGENSTERN

PHOTOGRAPH BY IRA BLOCK

When the United States Information Agency (USIA) began to plan the "Information USA" exhibition that is touring the USSR, they asked us to advise them on the software to include. We turned the assignment over to Steve Morgenstern, contributing editor. Steve both compiled the list of software and went to Moscow, the first stop on the 18-month tour (June 1987 to December 1988), to teach the American guides how to operate the computer systems. While there, he also spoke with Soviet citizens about computers. Here are several vignettes from his experience.

STEVE MORGENSTERN *also wrote this month's cover story, "Buyer's Guide to Computers."*

I sat in the blazing sunshine of Moscow last June, savoring the creamy coldness of wonderful Russian ice cream and watching the line snaking around the Elektrotekhnika pavilion at the Economic Achievements Exhibition park. The Soviets are renowned for standing in line. They wait with astonishing patience for such mundane items as bread and meat.

Even by Soviet standards, though, this line was impressive. Excited toddlers jostled against uniformed army men. Mothers fashioned newspaper hats from the morning edition of *Pravda*, and entire families crowded under large, black umbrellas to escape the sun's glare.

What compelled thousands of Soviets to endure three-, four-, even five-hour waits, day after day, for more than a month? The Americans were here. After an eight-year freeze on cultural exchange exhibitions, the Americans had come to the Elektrotekhnika pavilion to display their VCRs and satellite dish antennas, their music synthesizers and Universal Product Code supermarket checkout systems, and, foremost, their computers. Two dozen American guides were also present, fluent in Russian and ready to demonstrate the equipment and to discuss whatever might be on a visitor's mind. A rare opportunity indeed, and it was available without admission charge to all willing to stand in line. So they stood.

INSIDE THE "INFORMATION USA" EXHIBITION

In the Office area of the main exhibition, Marian Hagler, a guide from Washington, D.C., who earned a law degree from Georgetown, had set up an ingenious demonstration of Lotus *1-2-3* that both stimulated discussion and showed off the program's features. She created a spreadsheet model comparing income and expenses for typical American and Soviet citizens. The questions "What do you make?" and "How much do you spend?" were constantly fielded by all the Americans, but it was difficult to answer accurately. A meaningful comparison is not simply a matter of converting dollar figures to rubles. A typical Soviet might make only 200 rubles a month (about $300). Yet by American standards, their necessities are very inexpensive; rent might be just 20 rubles ($30) a month. However, "luxury" items include such commonplace commodities as tomatoes at 3 rubles ($5) a pound.

Using a spreadsheet, Hagler would fill in typical dollar figures for items in an American budget and ask the Soviet visitors to supply typical amounts for the same items in rubles. She then produced figures revealing the percentage of income spent in each category and even created charts and graphs to display the results. The Soviets became intensely involved in the give-and-take discussion and finally, with the computer's help, grasped the real difference between currency exchange rates and actual spending power.

Adding life to the computer demonstrations didn't always require that much effort. A few days after we arrived in Moscow, a young West German pilot named Mathias Rust made headlines around the world by flying a small Cessna at low altitude from Finland right through Soviet air de-

fenses and landing at the foot of Red Square. There were brief efforts to cover up the incident, but the truth quickly spread throughout Moscow. Linden Blue, an American guide and a pilot himself, incorporated the incident into his demonstration of *Flight Simulator* in the Home section. "Where should we go?" he would ask. "We could fly to San Francisco, or Los Angeles, . . . or maybe we should try to land on Red Square." The crowds loved it.

Crowds gather in front of Moscow's Elektrotekhnika pavilion, the first stop on the "Information USA" tour of the Soviet Union.

FAMILY & HOME-OFFICE COMPUTING contributing editor Steve Morgenstern (second from left) helps the American guides set up the computers for demonstrations. The sweatshirt on the woman at right says "Harvard" in Russian.

Long lines with up to five-hour waits did not faze the Soviet citizens eager to view American technology.

LIFE IN THE MEDIA CENTER

My grandmother left Russia about 70 years ago, preferring the Cossack-free streets of New York City. I came back to the "old neighborhood" on a six-week assignment working for the United States Information Agency (USIA) as Specialist in Residence at the "Information USA" exhibition.

One major responsibility was to meet one-on-one with Soviet "experts." The exhibit was divided into two sections. The large exhibit hall previously described was open to the public, but access to the smaller Media Center required a pass. Here, Soviets who were already familiar with computers or had some special need to discuss were invited to meet with the Specialists and to explore a software library of about 80 titles.

The Media Center attracted a high percentage of scientists and academics. Many had IBM compatibles in their offices. The Macintosh was more of a curiosity to them—several had read about Macs, but few had actually worked with them.

We had lively conversations about the relative merits of IBM versus Macintosh desktop-publishing systems and networking and laser-printer technology. Optical storage media was another hot topic, as was the educational use of computers. The discussions were conducted at a much more sophisticated level than I had anticipated; we were peppered with daunting technical questions. I've never felt the need to memorize statistics for the number of operations per second performed by an 80286 chip versus a 68020, but the figures certainly would have come in handy in Moscow.

Soviet businesspeople were frequent visitors, attentive to all we could show and tell them and sincere in their desire to improve their work by using computers. Officials from the telephone company, the railroad, the foreign trade bank, and many factories spent hours with us. Some were high-level executives; many others were middle-level managers hoping to come away with recommendations for their bosses. I demonstrated *Q&A*, Lotus *1-2-3*, and Microsoft *Windows* dozens and dozens of times, always holding the rapt attention of my audience.

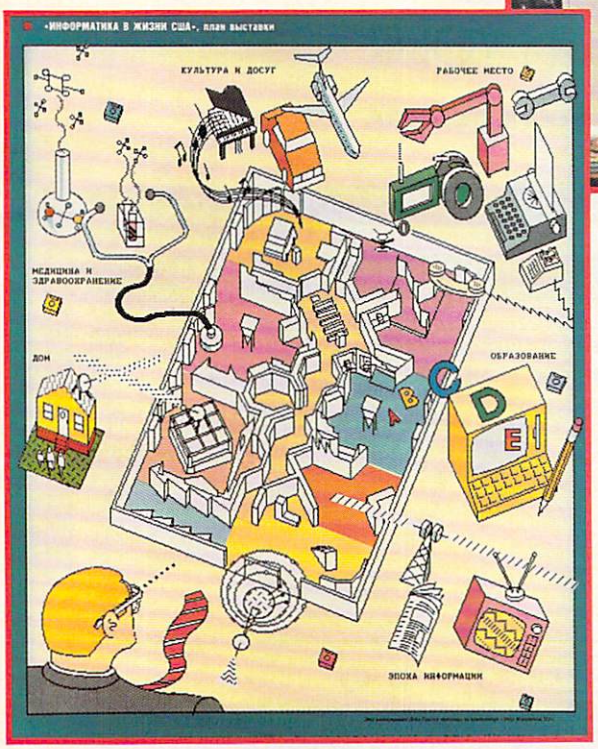
Many had difficulty grasping the idea that American businesses use general-purpose software tools and adapt them to the specific needs of the company. For example, I met with the manager of a factory that makes rivets and razor blades. He wanted to see the software that would run a factory that made rivets. I showed him how a database can be used to control inventory, keep employee records, and capture productivity information. I also demonstrated a spreadsheet for record keeping and planning and showed him how word processing could speed correspondence. He nodded in agreement for half an hour, then asked "But where is the software to run a rivet factory?"

SOVIET SCHOOLS AND COMPUTERS

While the scientific community surprised me with its level of computer access and expertise, I learned that the Soviet school system is far behind American standards in computer education. One expert from the Institute of Science and Aesthetics was developing "electromechanical devices" to simulate the workings of a computer for Soviet students. He explained that computers for schools are scarce, with little prospect for short-term improvement. Computer science is taught, but it is largely an abstract, conceptual topic; the students lack machines to try their hands at programming or using software applications.

I had lengthy discussions with Ivan, an editor from a Moscow publishing house, who brought his 13-year-old son with him. Ivan embodied the all-too-common resigned acceptance of the fact that modern technology is simply unavailable to everyday Soviets. We ran through a word-processing demonstration and discussed the process of doing research using on-line databases. I explained the system I use to file stories with my editor: writing at home, then sending the file via modem to my editor through his electronic mailbox where he retrieves it, edits it, and sends it via modem to the typesetter. I also showed him *PageMaker* running on the Macintosh. Using a Cyrillic font and some sample text files, I put together a Russian-language publication and printed a copy in about 10 minutes.

Ivan pointed in the direction of his son, Vasily, who was busily blasting asteroids on an Atari ST. Through protracted wrangling and bureaucratic machinations, Ivan was able to get his son into a special after-school computer program (they use half a



Above, Soviet children take to computers as quickly as their American counterparts. Left, a diagram of the "Information USA" exhibition done on a Macintosh and then hand-colored. Below, a button given to visitors symbolizing the connection between our nations.

dozen Yamaha MSX computers). How often does he go, I asked. "Officially, twice a week," Ivan replied. "Unofficially, eight days a week."

And what about you, I asked. Obviously a computer would be a tremendous help in your work. When do you think you'll get one? He shook his head and shrugged in a gesture which became familiar in my six-week stay. "Not in my lifetime," he said sadly. "Maybe for Vasily. But for me . . . ."

BULGARIAN FLOPPIES AND BLACK-MARKET DISKETTES

My best source of information about computing in the Soviet Union was indisputably the teenage boys who managed to obtain passes and made our Media Center their home away from home.

Of course, games were the young visitors' top priority. *Flight Simulator* on the Atari ST was a big hit, and the venerable *One on One* basketball running on a Commodore 128 was also well received. The language barrier did pose a problem when it came to the illustrated text adventure *Mindshadow*, although a few brave souls made admirable progress on *King's Quest*.

One question that came up with surprising frequency was how long our floppy disks lasted. I answered that as long as you avoid magnetic fields and keep it clean, a floppy should last for years. They showed me the Bulgarian-made 5.25-inch floppy disks they used and said the disks worked properly for about two months.

In my discussions, I did not get the sense that there was much of a black market for computer systems. Floppy disks, however, are sold on the black market at incredibly high prices. This is especially true of 3.5-inch floppies, which can be used with the Japanese MSX computers as well as with Macs and Atari STs. The going price for a blank 3.5-inch disk, which might cost an American as little as $1, was between 20 to 50 rubles, or about $30 to $65 each! In fact, I was offered a generous supply of vodka and caviar by one enterprising Russian to provide him with a few of these little gems. I looked with new respect at the 10-pack box of blanks in my hand, but had to refuse.

I also asked, if money was no object, whether a Soviet citizen could purchase a computer. One young man gave me the address of a store on Lenin Prospekt where the purchase could be made and even came back the next day to show me a Soviet computer magazine with a listing of all the different models that are "available." The one which I was told could actually be purchased boasted 64K memory, used a television set for a display device, and cost 500 rubles (about $750). Can you really just walk in and buy it, I asked, and he assured me you could. Subsequent visitors disagreed strongly, quoting waiting periods ranging from six months to a lifetime.

PERSONAL COMPUTERS IN THE SOVIET FUTURE

It seems inevitable that personal computers will become more widespread in the Soviet Union in the next few years. Survival in the international economic marketplace demands it.

Manufacturing will be a major pitfall, though. I was told repeatedly by Americans and Soviets alike that while the level of scientific knowledge in the USSR is impressive, the Soviets lack the capability to manufacture technically exacting equipment. This was borne out by their flaky floppy disks and also by a trip to the physics department at Moscow State University, where virtually all of the laboratory equipment was made in the West.

The more tantalizing question about Soviet computerization is cultural. Can you have widespread personal computer use in a country where information is kept under tight control? In the Soviet Union, private ownership of a photocopying machine is illegal. Even when you do find personal computers in use, there are virtually no printers. And the official plans for computerizing classrooms call for setting up a center in every school with 15 interconnected computers each—but only a single disk drive, at the teacher's desk.

Even if the Soviet leaders can come to terms with the expansion of personal freedom entailed in the growth of personal computing and solve their manufacturing problems, widespread acceptance of personal computers in the home and the workplace will be slow. In the Soviet Union today, the average citizen has no dealings with computers at all. Even calculators are scarce; virtually every store I visited totaled up bills using an abacus.

For hundreds of thousands of Soviet citizens, their first interaction with a computer will come courtesy of the USIA. Their "Information USA" exhibit is currently traveling through the Soviet Union, visiting major cities such as Kiev and Leningrad as well as more out-of-the-way locations including Irkutsk in Asia. At each exhibit site, average Soviet citizens are introduced to an important concept in American life: the use of computer technology to allow each individual to achieve his or her personal potential. ■

USING HYPERCARD

ORGANIZING INFORMATION WITH YOUR OWN FREE-FORM DATABASE

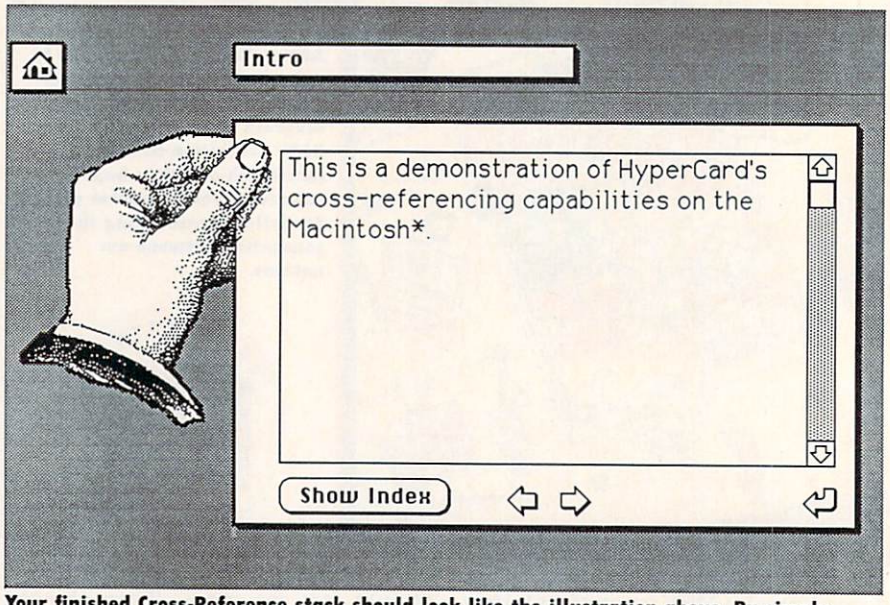
BY STEVE DRAZGA

Do you find databases too exacting? Do you become frustrated because each piece of data—such as name, street address, and zip code—must be entered into its own slot, or the program won't spit back the information correctly later?

If so, you'll want to know about another angle for organizing information—a free-form database. Perfect for such tasks as taking notes during a project, free-form databases let you enter data almost randomly, as you come across each piece, and then make cross-references between items as needed. Entering and then linking data in a casual structure is one of *HyperCard*'s great strengths. This month, you can try your hand at HyperTalk scripting by typing in the complete stack for cross-referencing text listed below.

Each card in *Cross-Reference* (as we'll call the stack) consists of two main parts: a text field for entering notes and an index field with all the keywords for the whole stack. While the text field's contents differ from card to card, the keywords listed in the index field are the same on each card. Whenever you want to cross-reference a particular word in your notes, the stack creates a new card with that word as the keyword. This method lets you easily find your information when you need it—without the tedious structuring that regular databases require.

Here's how you start.



Your finished Cross-Reference stack should look like the illustration above. By simply clicking on any word in your text field, you create a new card that is automatically cross-referenced by that selected word.

SETTING UP YOUR STACK

1. Go to the last card of your Home Stack. Set User Level to Scripting. If menu bar isn't showing, hold down COMMAND key and tap the SPACEBAR once to make it appear.

2. Choose "Open Stack . . . " from File menu. Insert the Ideas disk that came with *HyperCard*, ejecting a disk first if necessary. Open the stack called "Stack Ideas."

3. Click on small card named "Hand Card" in the lower-right corner of the Stack Ideas index. That takes you to the card with the hand, your background graphic.

4. Choose "New Stack . . . " from File menu. Name this new stack "Cross-Reference," then click on "New" dialog button.

5. When you copied the Hand card from the Ideas stack, you also (unknowingly) copied a field. So now, choose Field tool (top row right) from Tools menu; the field should appear. Double-click on this field to bring up its information box.

6. Name this field "Textual"; set style to "scrolling."

7. Then click on "Script . . . " to call the field's script editor. Type in the HyperTalk script from figure 1. Click on "OK" when done.

8. Press COMMAND–M to bring up message box. Type the following in the box and press RETURN: *set rectangle of field "Textual" to 160,85,484,268*

9. Choose "Background" from Edit menu. Choose "New Field" from Objects menu. Double-click on field. Name it "Holder" and click on "OK" button.

10. Highlight text in message box with mouse, then press DELETE or BACKSPACE to remove text.

11. Now we'll make this field disappear, but don't worry. Type the following in message box and press RETURN: *hide field "Holder"*

12. Choose "Background" again and then "New Field"; double-click on field. Name it "Index"; set style to "scrolling." Click on "Lock Text" button, putting an X there.

13. Now click on "Script . . . " and type in script from figure 2. Click on "OK."

14. Repeat step 10. Type the following in message box and press RETURN: *set rect of field "Index" to 4,68,131,304*

15. Choose "Background" again. Choose "New Field" once more; double-click on field. Name it "Title"; set style to "shadow." Click on "Lock Text" button. Click on "Font" button. Set text style to "Bold" and press RETURN.

16. Repeat step 10. Type the following in the message box and press RETURN: *set rect of field "Title" to 133,23,333,44*

MAKING BUTTONS WORK

Now we'll set up the buttons that do some of the stack's work.

1. First, drag the message box to the top of the screen, right below the Title field. Choose Button tool (top row middle) from Tools menu.

2. While holding down SHIFT key, double-click on the Return button (lower right) copied from your Ideas

STEVE DRAZGA *is the president of ART Incorporated, a Macintosh consulting and software development firm, in Moorestown, New Jersey.*

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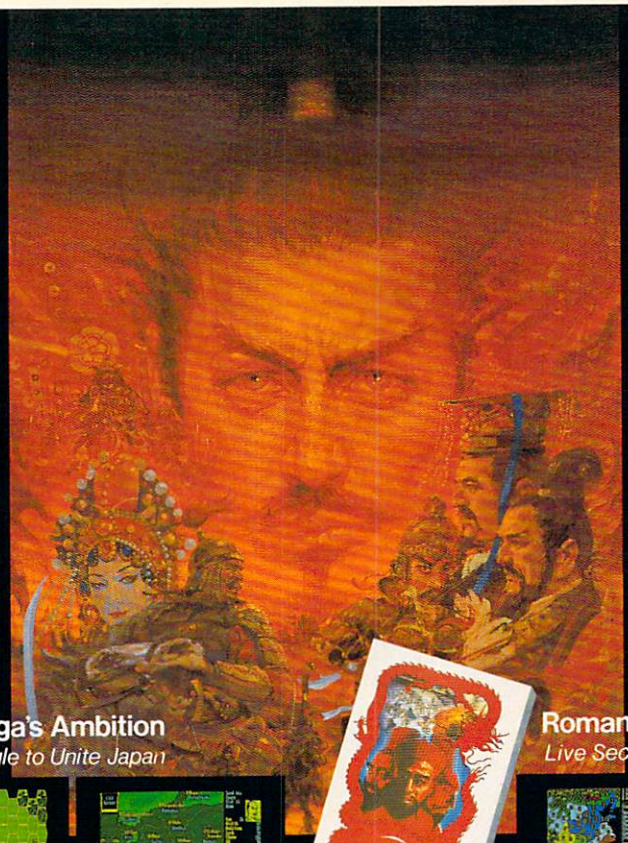

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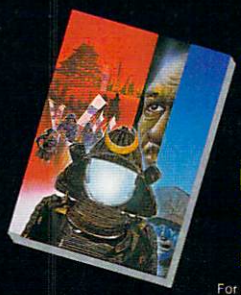
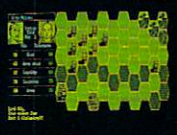


$59.95

Nobunaga's Ambition

The Struggle to Unite Japan



For the IBM PC and most compatibles.

The Japan most people don't know about. The Warring States period of the sixteenth century. Central government was weak and ineffective as feudal lords called daimyos gained power. Each daimyo ruled a single fief, each wanted to rule the nation. One man, Nobunaga Oda, came close but failed. He paid the price for failure, death.

Nobunaga's Ambition is a military, economic and diplomatic simulation for one to eight that puts you in Nobunaga's place, or in the place of one of his rivals. You start with one fief and try to take the entire nation. A game of both strategy and tactics, success takes careful planning and opportunism.

Administer your fiefs during peace to increase their strength. Keep your peasants and army loyal or risk revolt. Use your resources effectively, not spending too much on either guns or butter. Negotiate with other daimyos, or perhaps you'd rather just send ninja.

On the battlefield, control your troops in close tactical detail. Take advantage of terrain, attack, retreat, fight a war of attrition or go directly after the enemy general. Just be sure your side is smarter, tougher and better prepared.

Nobunaga's Ambition is fast moving and easy to play but historically accurate. Characters and game events come from the reality of sixteenth century Japan. Maps are almost entirely accurate, both geographically and politically. Advanced graphics and animation help give the game a feel of complete reality. One to eight may play either of two scenarios and five different levels of difficulty. Instruction manual and historical notes included.

Some comments from Japan's leading computer magazines:

"If you own a computer you've got to try this game".
OH! PC
January, 1987

"If the user can supply intelligence and imagination, Nobunaga's Ambition will provide more and better entertainment than any other game on the market".
Enter
August, 1986

"First released more than five years ago, Nobunaga's Ambition is still not just a best seller but one of the very best simulation games on the market".
Popcom magazine
January, 1987

"Nobunaga's Ambition is the absolute pinnacle of simulation gaming".
Mainichi Shimbun
May 7, 1987

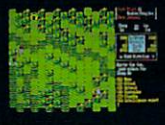
"A great hit"
Asahi Shimbun
February 20, 1986

"Far and away the most authentic simulation game I've ever seen".
Hiroharu Seki, professor of Political Science at University of Tokyo in an interview with *Tokyo Newspaper*.

$69.95

Romance of The Three Kingdoms

Live Second Century China



For the IBM PC and most compatibles.

China's second Han dynasty has collapsed. The entire nation battles with itself as warlords struggle for supremacy. You are a Master, one of these warlords determined to beat out the others and control the country.

Manage the states under your control to increase their power and resources. Cope with disasters, both natural and otherwise, when they occur. Choose good subordinates and win their loyalty. Negotiate with other Masters, or take a less diplomatic approach, controlling your armies and those of your generals in great tactical detail on the battlefield. Take advantage of terrain as best you can. Choose the right kind of attack for the situation, or just try and trick the enemy. Do what the immediate situation calls for but don't fail to think ahead.

A huge data base together with advanced graphics, animation and programming give the game an unprecedented degree of reality. Romance of The Three Kingdoms is based painstakingly on the Chinese epic novel of the same name, but is fast moving and easy to play. Features include:

*255 characters, each with a distinct personality
*Military, economic and diplomatic simulation
*Five different scenarios
*Ten levels of difficulty per scenario
*Play by one to eight
*Demonstration mode
*Complete instruction manual and historical notes.

"Our highest accolade to Koei's Romance of The Three Kingdoms".
Popcom magazine
May, 1987

"Highest award for a simulation game".
"All around best game".
Login
July, 1987

"A simulation game without peer".
Enter
August, 1986

"Romance of the Three Kingdoms is simulation gaming at its absolute best".
Technopolis
July, 1986

"Romance of The Three Kingdoms is a simulation war game that will strengthen any businessman's ability to work through a problem, logically or intuitively".
P. C. magazine
October, 1986

"Romance of the Three Kingdoms may be pricey but the entertainment it provides makes it a good buy at any price".
OH! FM
March, 1987

TO BE RELEASED JUNE, 1988

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CIRCLE READER SERVICE 37

Five scripts for the Cross-Reference Stack

Figure 1: Script for Field "Textual"

```
on mouseWithin
   global selectedWord
   if selection is not empty then
      set cursor to 4
      put selection into selectedWord

      if space is in selection then
         click at loc of target
         exit mouseWithin
      end if

      find selectedWord in field "Index"
      if the result is empty then
         visual dissolve to inverse
         visual dissolve
         go card selectedWord

         if the result is not empty then
            answer "Can't find link. Create a new one?" with "Yes" or "No"
            if it is "Yes" then
               doMenu "New Card"
               set the name of this card to selectedWord
               put selectedWord into field "Title"
               type tab
            else click at loc of target
         end if
      else
         answer "Do you want to create a new link?" with "Yes" or "No"
         if it is "Yes" then CreateNewLink
         else click at loc of target
      end if
   end if
end mouseWithin
```

Figure 2: Script for Field "Index"

```
on mouseDown
  set lockText of me to false
  click at the clickLoc
  click at the clickLoc
  put selection into selectedWord
  set lockText of me to true
  if selectedWord is not empty then
    visual dissolve very fast to inverse
    visual dissolve very fast
    go card selection
  end if
end mouseDown
```

Figure 3: Script for Button "Return"

```
on mouseUp
   visual effect dissolve to inverse
   visual effect dissolve
   go back
end mouseUp
```

Figure 4: Commands for Button "Hide/Show Index"

```
   if the short name of me is "Show Index" then
      set visible of field "Index" to true
      set name of me to "Hide Index"
   else
      set visible of field "Index" to false
      set name of me to "Show Index"
   end if
```

Figure 5: Script for Background "Reference"

```
on openCard
   put script of field "Holder" into field "Index"
   set scroll of field "Textual" to 0     --a zero
end openCard

on closeCard
   put empty into field "Index"
end closeCard
```

```
on CreateNewLink
   global selectedWord
   set cursor to 4
   put selectedWord & "*" into selection
   get script of field "Holder"
   put return & selectedWord after it
   set script of field "Holder" to it
   doMenu "New Card"
   set the name of this card to selectedWord
   put selectedWord into field "Title"
   type tab
end CreateNewLink
```

stack. Delete script that's already there by dragging from the first word to the last word—highlighting the text—and pressing DELETE or BACKSPACE.

3. Key in script from figure 3. Click on "OK."

4. Choose "Background" from Edit menu. Choose "New Button" from Objects menu. Double-click for its information box. Rename it "Hide Index."

5. Bring up button's script editor. Between the existing "on mouseUp" and "end mouseUp" commands, type in script commands from figure 4. Click on "OK."

6. Delete text from message box, as in step 10 above. Type the following in the message box and press RETURN: *set rect of background button "Hide Index" to 160,276,260,298*

7. Choose "Bkgnd Info . . . " from Objects menu. Name it "Reference"; click on "Script . . . " button. Delete existing script as in step 2.

8. Key in script from figure 5. Click on "OK."

TESTING, 1-2-3-4-5

Your cross-reference stack is now completed and ready to roll, except for a few one-time setup procedures.

1. Click on "Hide Index" button. Index field on left should disappear.

2. Repeat step 10 above to delete text from message box. Type the following in the message box and press RETURN: *put "Intro" into field "Title"*

3. Type the following and press RETURN: *set name of this card to "Intro"*

4. Type the following and press RETURN: *set script of field "Holder" to "Intro"*

5. Click on message box's "go-away" box (upper-left corner).

Now let's see how *Cross-Reference* works by testing the stack.

Click in the upper left of the text field and write, "This is a demonstration of *HyperCard*'s cross-referencing capabilities on the Macintosh." Then double-click on the word "Macintosh." When asked if you want to create a new card link, answer "yes."

An asterisk will be added after the word "Macintosh," and a new card will appear with that word as a keyword. Now you can add any information you want about the subject Macintosh to the new card created by the stack.

From now on, whenever you click on the word "Macintosh" in your text (whether it's asterisked or not), you'll go to the card that has "Macintosh" as a keyword. And every time you double-click on a word in your text that is not a keyword, you can create a new cross-referenced card.

Now click on the "Show Index" button to bring up the Index field. It should hold two keywords: Intro and Macintosh. Click on "Intro" to take you to that card; click on "Macintosh" to return to the new card. You'll be able to use the Index field to quickly jump to any card in the stack.

FINAL THOUGHTS

If you get an error message as you test the stack, first correct the typing error in the script. Then type the following into the message box and press RETURN: *set script of field "Holder" to empty*

Now delete all cards except for the first one, named "Intro," by choosing "Cut Card" from the Edit menu. Finally, type the following into the message box and press RETURN: *set script of field "Holder" to "Intro"* ■

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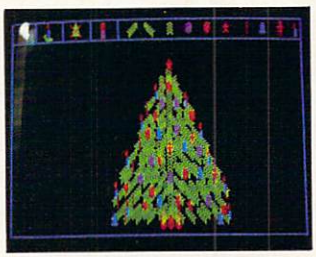

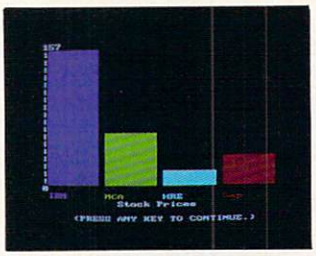

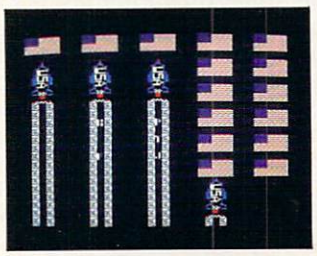

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Apple-Productivity II Series OB89600		**Commodore-Holiday 64/128(C64mode)** OB89608	
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PRODUCT REVIEWS

EVALUATIONS OF COMPUTERS, PERIPHERALS, AND OTHER HOME-OFFICE EQUIPMENT

Apple MIDI Interface

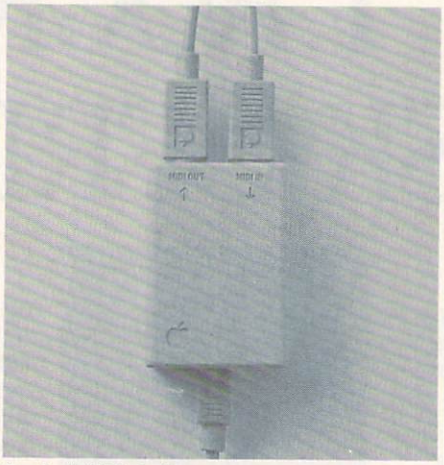
MANUFACTURER: Apple Computer, Inc.
ADDRESS: 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010
HARDWARE REQUIREMENTS: Apple IIGS or Macintosh
PRICE: $99

If you have an interest in electronic music, you probably know that MIDI makes possible the link between computers and musical instruments. MIDI (Musical Instrument Digital Interface) is a communications protocol that standardizes the way information is exchanged back and forth between computers and musical instruments. With the right software, an electronic instrument, and a MIDI interface, you can use your computer to compose, arrange, and play music.

Apple Computer has recently introduced its own MIDI interface for Apple IIGS and Macintosh owners. The Apple MIDI interface is a small, rectangular box (3-by-2-by-1.25 inches) containing ports that connect the company's computers to MIDI instruments. Included in the package are two standard MIDI cables, a cable to connect the interface to a IIGS or Macintosh, and an easy-to-understand owner's guide. (If you have a 128K or 512K Macintosh, you'll need a different cable.)

Compared to many other interfaces I've seen, the Apple MIDI interface is a very simple device with no moving parts or confusing frills. There is a MIDI "IN" port (for bringing information into a computer or instrument), a MIDI "OUT" port (for sending information out of a computer or instrument), and a port for connecting the MIDI interface to a computer's modem or printer connector. In contrast, more elaborate MIDI interfaces may have many ports, as well as switches and lights useful for selecting among modem, printer, and MIDI interfaces.

Since the Apple interface comes with all the cables needed to attach a MIDI instrument to a computer, it's an ideal purchase for MIDI beginners. Professional musicians, however, may find only one MIDI



Apple MIDI Interface

"IN" and "OUT" to be limiting, because professionals generally use many MIDI instruments simultaneously. If you plan to use an "orchestra" of synthesizers and drum machines with the Apple MIDI interface, you should expect to add more MIDI hardware—such as extra cables—to your system.

The Apple MIDI interface is easy to install and comes with everything you need for getting your MIDI setup off the ground . . . that is, if you already have a MIDI instrument (a drum machine or a keyboard, for example) and some MIDI software. In next month's issue, I'll profile individuals who are putting MIDI to work.

—JOEY LATIMER

CIRCLE READER SERVICE 100

Arche Rival 286 Computer

MANUFACTURER: Arche Technologies
ADDRESS: 745 High St., Westwood, MA 02090; (617) 422-4674 or (800) 422-4674
PRICE: $2,195

Imagine my surprise when I opened the box containing the Arche Rival 286 and saw that the logo of its manufacturer, Arche Technologies, resembles a McDonald's golden arch.

My first thought was that the folks at Arche have either a wonderful sense of humor or great lawyers. Then the doubts began: "If they need this gimmick," I thought, "then what's wrong with the computer?" I started looking for the slip-up.

There was no problem with the slim 53-page manual. It has actual photographs of all the parts; they're clearly labeled and even show you what the system should look like when everything is connected properly. Every step toward making the computer operational is illustrated, and comprehensible text explains the pictures and diagrams.

As with most current clones, there are options galore but the stripped-down, basic model comes standard with 1MB of RAM. The basic unit also includes a 1.2MB 5.25-inch floppy drive, an enhanced (101 keys) keyboard, two parallel ports, two serial ports, five free expansion slots (eight total), a Hercules graphics adapter, and an outstandingly sharp amber monitor—all for $2,195.

The model I reviewed had two

ARCHE RIVAL 286 SPECIFICATIONS

MICROPROCESSOR: Intel 80286 (8/12MHz)
MEMORY: 1MB
OPERATING SYSTEM: MS-DOS 3.3
DISPLAY: 14-inch amber monitor; Hercules graphics card
BUILT-IN PORTS: Four (two parallel, two serial)
AVAILABLE EXPANSION SLOTS: Five
DISK DRIVES: One 1.2MB 5.25-inch
SOFTWARE INCLUDED: MS-DOS 3.3 and GW-BASIC
WARRANTY: Two years

5.25-inch floppy drives and a 20MB hard disk. (Options are available for using 3.5-inch floppies and for upgrading the hard-disk storage to 80MB or more.) The amber monitor that comes with the basic unit is a joy. The text is as sharp as can be, easing eye strain after extended periods of computer use.

All the software I tried ran perfectly at both 8MHz and 12MHz. I had to reconfigure one word-processing package because the cursor speed was boosted so much that when I was just a little heavy-handed with the cursor keys, I found myself three screens away from where I wanted to be.

OK, so the documentation is first-rate, and the computer is solid, looks attractive, and seems to be built to last. But what if something goes wrong? Arche guarantees the computer for two years, as long as you buy from an authorized dealer. What are these people up to? Do they actually believe that building a good computer at competitive prices, providing proper support, and standing behind it unhesitatingly is going to attract customers? Indeed they do, thank goodness.

All I can say is that when I finished the review and had to return the Rival 286 to Arche, the amused smile that had been on my face when I first removed the computer from its box took on a wistful quality. I can't help but end this review with a pun—when it comes to value, there are few rivals for the Rival 286.

—STEVE MILLER

EDITOR'S NOTE: *The model reviewed was a preproduction model.*

CIRCLE READER SERVICE 101

IBM Personal System/2 Model 50

MANUFACTURER: IBM Corp.
ADDRESS: Old Orchard Road, Armonk, NY 10504; (800) 447-4700
PRICE: $3,595

What seemed new and exciting just a short while back has already lost its bloom—especially with IBM promising a steady stream of new computers. So, even as IBM ballyhoos its current Personal System/2 line of computers, we hear of machines with increased capabilities and lower prices from IBM and from its competitors. Nevertheless, the PS/2s are here, hoping to recapture some of the ground lost to PC clones on the one hand and the Macintosh on the other.

IBM PERSONAL SYSTEM/2 MODEL 50 SPECIFICATIONS

MICROPROCESSOR: Intel 80286 (10MHz)
MEMORY: 1MB
OPERATING SYSTEM: PC-DOS or OS/2 (not included in basic price)
DISPLAY: VGA built into motherboard; no monitor included
BUILT-IN PORTS: Three (serial, parallel, and pointing device)
AVAILABLE EXPANSION SLOTS: Three
DISK DRIVES: One 1.44MB 3.5-inch floppy and a 20MB hard drive
SOFTWARE INCLUDED: *Model 50/60 Reference Diskette*

The hot-selling PS/2 Model 50, while based on the same processor as the PC AT (the Intel 80286), has enough design innovation inside the box to warrant its claims to newness. The two big differences between the older PC AT and the Model 50 are Micro Channel bus architecture and the built-in Video Graphics Array (VGA) display technology. Micro Channel, a high-speed data movement system, was designed to facilitate multitasking and network connectivity, while VGA display capability puts the Models 50, 60, and 80 in the same game as the Macintosh.

Features. With the Model 50, there's no need to add this or that hardware to get the machine up to speed. Three expansion slots (for Micro Channel-compatible boards only) are available, and the memory can be expanded to a total of 7MB. In addition to the 1MB of standard, system-board memory, the test computer came with 4MB of memory installed in two expansion slots. These boards are, of course, extra-cost options, and you cannot use any of the boards that you might have installed in an IBM PC. (The Model 60, incidentally, has seven slots and memory expansion to 15MB.) The 80286 runs at 10MHz, a meaningful contrast with the PC's 4.77MHz, but not exceptionally fast when compared to other AT-class machines. The video display is a visual feast, allowing up to 256 colors on the screen at once.

A single 3.5-inch disk drive, with a 1.44MB capacity and a 20MB hard disk (with an unusually slow access speed of 65 milliseconds) are standard. A second external 3.5- or 5.25-inch drive can be added. Other features include serial, parallel, and pointing-device ports; a battery-powered real-time clock; the usual high-quality IBM keyboard (enhanced version—the one with the extra set of of editing keys and 12 function keys); and a relatively small footprint (16.5-by-14.1 inches) and light weight (23 pounds). The computer we tested came with an IBM 8513 12-inch color monitor ($685). Given the graphics output capability of the computer, this is a good choice. However, the IBM monochrome monitor ($250) will reproduce color output as 64 shades of gray.

Central to IBM's marketing strategy is the new operating system called OS/2, which is designed to exploit the multitasking hardware capability of the PS/2 line (excluding the Models 25 and 30). You needn't buy OS/2 (not cheap, running about $325 and requiring at least 2MB), because these computers will run PC-DOS/MS-DOS. Eventually, OS/2 should be the way to go, but, for now, applications software designed to run under OS/2 is scarce. If you do convert immediately to OS/2, you will still be able to move back and forth between the two systems through the OS/2 menu.

Using the Model 50. The only software supplied with the Model 50 is what IBM calls *Model 50/60 Reference Diskette*, which tests the computer, shows off the display capabilities, allows you to customize the system configuration and to make backups of the disk, and gives you a tutorial tour of the system.

Unfortunately, you'll have to sup-

ply DOS and software. Using DOS 3.3 (which costs an additional $120), I ran a variety of software, all without a hitch. The obvious improvements over my 8088 machine are in speed of operation and display quality. (I tested a Zenith flat-screen monitor on the Model 50, and, as impressive as IBM's own monitor may be, the Zenith is a new visual experience *[see review in this section].*)

One thing I have never liked about IBM machines is the interminable bootup time. The Model 50 continues the tradition. Any number of IBM compatibles do it faster. I also don't like the attempt to boot from the A drive even when the hard disk is bootable. Zenith, for example, allows you to set the default boot drive with the DIP switch. This means that if you've locked a disk into the A drive, the system will not insist on trying to boot from it and will go right to the hard disk.

Compared with a plain-folks PC XT, the Model 50 is a lot of computer. Compared with a jazzed-up PC AT, it's not so much, although Micro Channel has a lot of potential (as yet unrealized, it should be noted). You can run OS/2 on nearly any 80286 computer, and you can add video boards, extended memory, monitors of any quality, or even an 80386 speed-up card (for around $1,000) to an AT-type of computer. But if you don't care to tinker—or are a beginning computerist who feels that multitasking and other Micro Channel features can play a valuable role in your computer operations—then you should take a close look at the Model 50. —HENRY F. BEECHHOLD

CIRCLE READER SERVICE 102

Phone-Mate 9750 Two-Line Telephone and Answering Machine

MANUFACTURER: Phone-Mate, Inc.
ADDRESS: 325 Maple Ave., Torrance, CA 90503; (213) 618-9910
PRICE: $280

I hate to admit it, but the most critical piece of hardware in my office isn't my computer. It's my telephone.

Yet, I coddle my computer, spoiling it—for productivity's sake, of course—with new software, peripherals, and accessories as often as I can. And, until recently, I shamelessly neglected my telephone system.

Not too long ago, my phone setup consisted of two standard push-button telephones, two jacks, and an assortment of co-workers to take messages. Sure, the phones cluttered my desk, and calls occasionally went unanswered; I knew my phone system wasn't flawless but it was enough for me. Or so I thought. It wasn't until I replaced my two phones, my desk clock, and my pink "While You Were Out" message pads

Phone-Mate 9750 two-line telephone/answering machine

with a feature-packed, two-line phone/answering machine/digital clock from Phone-Mate that I exposed the feebleness of my original telephone setup.

Phone-Mate, a well-known leader in the answering-machine industry, likes to make good things in small packages. The very sleek Phone-Mate 9750 measures just 2.5-by-8.5-by-7.5 inches (about the size of a thick hardcover book). Yet, its feature-laden answering machine lets you dictate memos and reminders for yourself and others in your office; record telephone conversations; record two different greetings; record messages on one line while you're talking on the other, and remotely retrieve, save, replay, and erase messages, record new greetings, and turn on your machine.

One of the answering machine's best features is its nifty computerized voice (it sounds just like a corporate voice messaging system) that alerts you to new messages, tells you the date and time of each call, and gives operating instructions.

The two-line telephone isn't nearly as noteworthy. There's on-hook dialing (but no speakerphone) and an autodial feature (but for only nine phone numbers). And the telephone's ring is too low; if I step out of my office, I can't hear the melodic hum.

In spite of these minor criticisms, I haven't seen any other two-line phone/answering machine that's as small, smart-looking, and simple to set up and use as the Phone-Mate 9750. And although $280 (you can find it for considerably less) may sound like a lot to spend on a telephone, you're getting quite a bit of technology—and professional credibility—for your money.

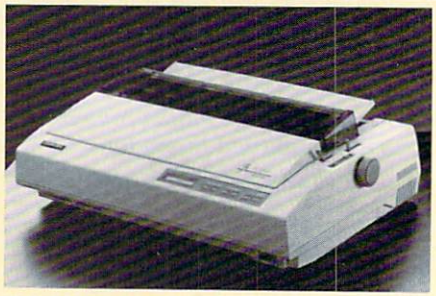
—BERNADETTE GREY

CIRCLE READER SERVICE 103

Toshiba P351SX Printer

MANUFACTURER: Toshiba America, Inc., Information Systems Division
ADDRESS: 9740 Irvine Blvd., Irvine, CA 92718; (714) 583-3000
HARDWARE REQUIREMENTS: Any computer with a parallel port
PRICE: $1,599

The Toshiba P351SX is for small-business operators who want a fast and versatile 24-pin printer—and are willing to pay a premium price for that versatility. The wide-carriage printer can hum along at 360 characters per second (cps) in draft mode or 120 cps in letter-quality mode (in pica type). As for versatility, it's hard to know just where to begin. Built-in parallel and serial ports make it easy



TOSHIBA P351SX PRINTER SPECIFICATIONS

TYPE: 24-pin dot matrix
DRAFT SPEED (PICA): 360 characters per second (cps)
LETTER-QUALITY SPEED: 120 cps
GRAPHICS RESOLUTION: 360-by-360 dots per inch
DIMENSIONS: 23-by-15.5-by-5.5 inches
WEIGHT: 33 pounds
INTERFACE: Parallel port
BUILT-IN EMULATION: Qume, IBM Proprinter, and IBM Graphics printers ($149 for Epson JX80 or LQ series and Diablo 630 printers)
PAPER WIDTH: 4 to 15 inches
PORTS: Parallel and serial

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CIRCLE READER SERVICE 1

to interface the P351SX to just about any computer.

It wasn't easy for me to get the hang of working the LCD-based front panel. The two-line display, accompanied by six selection buttons, offers a nonvolatile configuration system that eliminates DIP switches and allows the user to easily reconfigure the printer in seconds. It took me an hour or so to initially configure the printer and get the feel of the menu structure, but once I did, it became almost enjoyable to change such standards as typeface and pitch.

The P351SX has seven built-in fonts, which can be selected either through the front panel or by software. Two slots on the lower front of the printer can receive credit-card-size ROM cards that can each hold two additional fonts. Alternatively, these cards can hold enough RAM to double the printer's buffer from 32K to 64K or even enable it to emulate other printers.

The P351SX has the ability to print graphics at a resolution of 360-by-360 dots per inch. It also has an extensive library of built-in functions and capabilities such as proportional spacing, boldfacing, superscripting and subscripting, and double-size characters that allow a broad palette of alphanumeric possibilities.

The feature that most impressed me, however, was the printer's paper-handling capabilities. It comes with a built-in tractor feed but also can be fed single sheets of paper separately. The good part is that you don't have to remove one to use the other—a great convenience when it is regularly being used for more than one task.

Anyone who does a lot of word processing or mail merging will appreciate the bulk-cut, sheet-feed options available. The single-sheet feeder ($499) will automatically load single sheets, while the optional double-sheet feeder ($699) will allow you to have a bin of letterhead and a bin of plain bond paper to write multipage letters automatically, for instance. In addition, Toshiba offers an envelope feeder ($699) to expedite mail-merge operations.

But all of these bells and whistles have a price. The P351SX has a list price of $1,599, though you may be able to find it considerably discounted. Font cards are available for $79. Readers who are familiar only with traditional 9-pin dot-matrix printers may not be aware that the newer, more expensive 24-pin machines really do create very-near-letter-quality output.

The P351SX is well designed for business use. One person's bells and whistles are another person's requirements, and, even though it's expensive, some people demand that kind of versatility. Prospective buyers who need at least 24-pin print quality and have business needs that can't be satisfied with a laser printer in the same price league (filling out forms or printing envelopes, for instance), would be well advised to take a long look at this one.

—DAVID WILSON

CIRCLE READER SERVICE 104

Zenith High-Resolution RGB Monitor

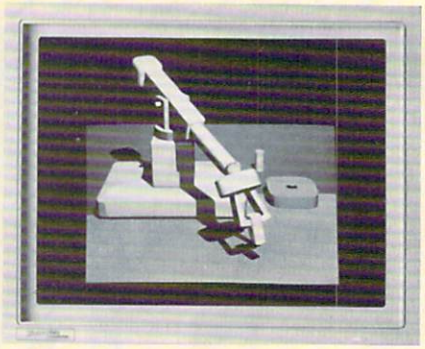
MANUFACTURER: Zenith Data Systems
ADDRESS: 1000 Milwaukee Ave., Glenview, IL 60025; (312) 699-4800
HARDWARE REQUIREMENTS: IBM PC or compatible or PS/2; VGA board
PRICE: $999

Once you spend a few minutes with a Zenith Flat Tension Mask (FTM) monitor, you'll have a heck of a time making yourself go back to your old monitor.

The Flat Tension Mask makes the monitor's face literally flat. Not sort of flat, or flatter, but ruler flat. Until you become accustomed to looking at this new visual display world, it will look as though the display is curving inward. You'll give the screen a poke just to make sure! But when your perception adjusts, the picture is like a wall.

FTM technology uses much more electrical power than do ordinary monitors, and, as a result, generates images of unsurpassed clarity, brilliance, and color saturation. The colors are truly delicious. Not only that, but the monitor can display as many as 256 colors at once from a palette of more than 261,000.

For desktop publishing, computer-aided design, and other graphics/text or straight graphics applications, this would seem to be an ideal monitor. The images are as crisp as fresh lettuce and are geometrically accurate. You can actually take correct measurements directly from the screen. The machine's specifications



ZENITH ZCM-1490 SPECIFICATIONS

SCREEN SIZE (DIAGONALLY): 14 inches
BANDWIDTH: 25MHz
HORIZONTAL SCANNING FREQUENCY: 31.49KHz
DOT PITCH: .28 millimeters
MONITOR SIZE: 12.25-by-14.75-by-15.50 inches
WEIGHT: 40 pounds
PRICE: $999

(see box), in combination with the flat, no-glare screen, make for a visually smashing picture.

The $999 monitor (you can find it for around $700) is compatible with any IBM PC, PS/2, or compatible and with a VGA-compatible display card. Zenith, understandably, pushes its own Z-449 VGA-Type Video Adapter, which handles all the current video modes: CGA, EGA, MDA/Hercules, and VGA. I tested the monitor with an IBM PS/2 Model 50.

You can tell by now that I'm impressed. Once you've seen the ZCM-1490 in action, you'll know why I'm going on and on. The black glass screen, glare-proofing, flat display, and incredibly vibrant colors make for the happiest CRT staring sessions I've ever had. Because of a built-in fan, the energy-consuming monitor produced relatively little heat, even after hours of continuous use. And the image held as fixed as a photograph. I've got to believe that FTM is the future of the CRT type of display.

I wish I could find something to complain about, just to give credence to my ravings, but I can't. I like everything about this monitor. Well, OK, one small complaint: it's difficult to wipe fingerprints off the Zenith monitor. Ah, and another: At 40 pounds, it's a dog to move around—especially for us weaklings.

—HENRY F. BEECHHOLD

CIRCLE READER SERVICE 105

SOFTWARE GUIDE

Welcome to FAMILY & HOME-OFFICE COMPUTING's Software Guide. The following table relates to the review charts that follow. It lists the various types of computers as designated under "hardware required" (and other hardware designations in this issue) and the models included under each designation.

DESIGNATION	MODELS
Amiga	500, 1000, 2000
Apple	II, II Plus, IIe, IIc, IIGS (in IIe/c mode)
64K Apple	II Plus, IIe, IIc, IIGS (in IIe/c mode)
128K Apple	IIe, IIc, IIGS (in IIe/c mode)
Apple IIGS	IIGS only
Atari	800, 600XL, 800XL, 65XE, 130XE
Atari ST	520ST, 1040ST, MegaST
C 64/128	C 64, C 128 (in 64 mode)
C 128	C 128 only
IBM PC	PC, XT, AT, PS/2, and compatibles
Macintosh	128K, 512K, Plus, SE, II
Tandy CoCo	2, 3

Please note: All Apple designations (except for IIGS) include compatibles such as the Laser 128 or Franklin 500. Titles listed for the IBM PC will also run on most IBM PC compatibles (as well as the IBM PS/2 series); check with the publisher of the program or your dealer for compatibility. Any additional hardware listed is required unless noted as "recommended" or "optional." In many cases, "2nd drive" refers to either a floppy-disk drive or hard-disk drive. *KEY:* **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user. **PS** = Play system (in the Entertainment reviews), the quality of the game's design and its playability. **GQ** = Graphics quality, evaluated in light of each model's graphics capabilities. **EU** = Ease of use after the initial learning period; varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware required	CP	Ratings O	D	EH	GQ	EU	V
BETTER WORKING WORDPROCESSOR Spinnaker Software One Kendall Square Cambridge, MA 02139 (617) 494-1200 $30 ©1987	More power than you might expect in such an inexpensive word processor. Includes such advanced features as an outliner, a spelling checker, and extensive printer support. It's menu-driven, too, for ease of use; yet once you learn the basics, there are also shortcut keys to speed up operations. —CAMPBELL	256K IBM PC. Hercules, CGA, EGA optional.	N	★ ★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★ ★
FAST FORMS Shana Enterprises Inc. 9650 20th Ave., #105 Edmonton, Alberta Canada T6N 1G1 (403) 463-3330 $149 ©1987	Personal tool kit for creating forms—any kind from an invoice to a telephone message form. First, you design forms with the drawing module. Then you call the forms to screen with the desk accessory as you need to fill them in. Data can be used with other programs such as Microsoft *Works*.† —MANSFIELD	512K Macintosh. 2nd drive recommended (required if 400K).	N	★ ★ ★ ★	★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
FILE RESCUE PLUS Three-Sixty Pacific, Inc. 2105 S. Bascom, #290 Campbell, CA 95008 (408) 879-9144 $50 ©1987	Does more than just rescue deleted files from your disk. Can also "optimize" the location of files on a hard disk (which speeds up its operation), check a disk for flaws (which can prevent lost data), and more. Help screens only make for limited documentation. —CAMPBELL	256K IBM PC.	N	★ ★ ★	★	★ ★ ★	N/A	A	★ ★ ★
4WORD Turner Hall/Symantec 10201 Torre Ave. Cupertino, CA 95014 (408) 253-9600 $100 ©1987	Enhances Lotus *1-2-3* by adding a word processor that includes most common features, as well as mail merge and links with data from *1-2-3*. However, embedded printer codes are necessary, and you must use nested menus similar to those of *1-2-3*. —GUARDINO	320K IBM PC. (Requires 64K beyond *1-2-3*.) 2nd drive. Lotus *1-2-3*, version 2.0 or higher.	N	★ ★	★ ★ ★	★	N/A	A	★ ★
LESCRIPT V.1.70 Anitek Software Products P.O. Box 361136 Melbourne, FL 32936 (305) 259-9397 $200 ©1983–1987	Long popular on the older TRS-80 machines, this MS-DOS version might have appeal for users upgrading to newer models. *LeScript* is a powerful but slow and hard-to-use word processor that demands you learn many commands to control it. —SUMMERS	128K IBM PC. 2nd drive optional.	N	★ ★	★	★	N/A	D	★
LUCID 3-D Personal Computer Support Group 11035 Harry Hines Blvd., #200 Dallas, TX 75229 (214) 351-0564 $149 ©1987	A spreadsheet that works two ways—either stand-alone or memory-resident. Packs a solid range of features, too, including 51 built-in functions, macro capabilities, and up to nine windows on-screen simultaneously. A built-in notepad is also quite handy. † —MORGENSTERN	256K IBM PC. 2nd drive.	N	★ ★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★ ★

RATINGS KEY O Overall performance: **D** Documentation: **EH** Error-Handling: **GQ** Graphics Quality: **EU** Ease of Use: **V** Value for money: ○ Poor: ★ Average: ★★ Good: ★★★ Very Good: ★★★★Excellent: N/A Not Applicable: E Easy: A Average: D Difficult: **CP** Copy Protected, yes or no: † Longer review follows chart

BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware required	CP	Ratings O	D	EH	GQ	EU	V
PERSONAL NEWSLETTER Softsync, Inc. 162 Madison Ave. New York, NY 10016 (212) 685-2080 $50–$60 ©1987	Quite a lot of desktop-publishing sophistication for the money. Your newsletters can be up to 10 columns wide and can include several kinds of graphics and banner headlines. Basically easy to use, since the manual acts as a good guide.† —SOLOMON	Reviewed on 128K Apple (enhanced). Also for C 64/128 (with GEOS). 2nd drive recommended. Mouse, joystick (C 64).	N	★ ★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★ ★
PUBLISH IT! Timeworks, Inc. 444 Lake Cook Road Deerfield, IL 60015 (312) 948-9200 $100–$150 ©1987	Much like software on the Macintosh, this desktop-publishing package offers pull-down menus, scroll bars, dialog boxes, and icons. While these devices make it easier to use, the program still requires time and patience to learn it completely.† —SOLOMON	Reviewed on 128K Apple (enhanced). Also for 512K IBM PC. 2nd drive. Mouse or joystick (optional IBM).	N	★ ★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
SUITCASE Software Supply 599 N. Mathilda Ave.,#210 Sunnyvale, CA 94086 (408) 749-9311 $60 ©1987	Lets you leave Apple's limit of 15 desk accessories (DAs) and 200 fonts per System file in the dust. Once installed (just drag into System Folder), it enables you to choose any DA or font that's on your disk. It's a great way to use the Mac more efficiently. —HALLERMAN	512K Macintosh. Hard-disk drive optional.	N	★ ★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★ ★

EDUCATION & CREATIVITY

Title Publisher Price	Brief description	Hardware required	CP	Ratings O	D	EH	GQ	EU	V
FORESIGHT The Learning Curve P.O. Box 980576 Houston, TX 77098 (713) 520-8545 $50 ©1987	Test yourself or challenge others with this hangman-type word game based on facts and trivia. Improves word recognition and quick recall, but it's not remarkable. Eight built-in subjects include capital cities, books, movies, foreign phrases, and athletes. —SOLOMON	512 Macintosh.	Y	★ ★	★ ★	★ ★	N/A	E	★
MAVIS BEACON TEACHES TYPING! The Software Toolworks One Toolworks Plaza 13557 Ventura Blvd. Sherman Oaks, CA 91423 (818) 907-6789 $40–$50 ©1987	Typing tutor for ages 5 through adult uses artificial intelligence and entertaining text to keep you interested. *Mavis* adjusts to your age and skill level and suggests new activities when she "senses" frustration or fatigue. Extras include a road-race game and resumé-writing program. Excellent.† —SUMMERS	Reviewed on 256K IBM PC. Also for 512K Amiga, 48K Atari, C 64/128, 64K Apple, 512K Macintosh. CGA or Hercules recommended (IBM).	Y	★ ★ ★ ★	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★
ONCE UPON A TIME Compu-Teach 78 Olive St. New Haven, CT 06511 (203) 777-7738 $40 ©1987	Youngsters ages 6–12 write and illustrate storybooks with farm, main street, or safari themes. Improves reading, spelling, and vocabulary. Four sample storybooks offer excellent starter suggestions. Comes with colored pencils for drawing. —ANDERSON	256K IBM PC. Also for 128K Apple. 2nd drive. Printer recommended.	N	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★	E	★ ★ ★
RIDDLE MAGIC Mindscape 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 $50 ©1987	What do you call a cow you can sit on? *(A cowtch!)* Intended for school use, *Riddle Magic* offers hours of educational fun. Parents will find excellent teacher-aimed suggestions and activities to try with their children. Prints text and graphics. —ZORNBERG	64K Apple.	Y	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★	A	★ ★ ★
TICKET TO SPAIN Blue Lion Software 90 Sherman St. Cambridge, MA 02140 (617) 876-2500 $30–$40 ©1987	Learn Spanish as you search Spain for a missing family heirloom. To succeed, you must answer questions about Spanish history, politics, and geography, as well as perform everyday tasks. Play with either Spanish or English instructions and clues.† —ELTGROTH	Reviewed on 128K IBM PC. Also for C 64/128, 128K Apple. Hercules or CGA (IBM).	Y	★ ★ ★	★ ★ ★	★ ★ ★	★	D	★ ★ ★
WETPAINT, VOL. 1 & 2 Dubl-Click Software 18201 Gresham St. Northridge, CA 91325 (818) 349-2758 $60 ©1986-1988	An attractive collection of clip art that's great for brochures, fliers, and newsletters, but not laser printouts. Hundreds of drawings include symbols, borders, animals, arrows, foods, maps, and such common office objects as push pins and telephones. A good deal. —HALLERMAN	128K Macintosh. 512K recommended for desk accessories.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★

RATINGS KEY **O** Overall performance: **D** Documentation; **EH** Error-Handling; **GQ** Graphics Quality; **EU** Ease of Use; **V** Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★Excellent; N/A Not Applicable; E Easy; A Average; D Difficult; **CP** Copy Protected, yes or no; † Longer review follows chart

ENTERTAINMENT

Title Publisher Price	Brief description	Hardware required	CP	Ratings O	D	PS	GQ	EU	V
ALIEN FIRES Paragon Software/ Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 $40 ©1988	Outer space role-playing adventure that's big on graphics and sound effects, but small on vocabulary. You may not have enough patience to find the words and phrases to interact with other characters and perform tasks. For the experienced gamer only. —DELSON	Reviewed on 512K Amiga. Also for C 64/128, 256K IBM PC. Mouse, 2nd drive optional.	N	★ ★	★	★	★ ★ ★	D	★ ★
BARBARIAN Psygnosis, dist. by Computer Software Services 2150 Executive Drive Addison, IL 60101 (312) 620-4444 $40 ©1987	As Hegor, dragon-slaying barbarian, you descend into the underground world of Durgan. Fight off "Tin Man," "Pit Bull," and other gnarly monsters, as you wend your way to the evil wizard Necron. Difficult to master, but it's fun trying. Graphic details, especially animation, are excellent. —ROSKILL	Reviewed on 512K Atari ST. Also for 512K Amiga. Color monitor.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
FIRE POWER Microlllusions 17408 Chatsworth St. Granada Hills, CA 91344 (818) 360-3715 $25–$32 ©1987	Fire up your tank and show 'em who's boss in this town by capturing your opponent's flag and bringing it home. With three modes of play—including two players via modem—this shoot-'em-up features excellent graphics and sound effects. Great fun. —ROSTON	Reviewed on 512K Amiga. Also for 512K Apple IIGS, C 64/128, 512K IBM PC, 512K Macintosh. Joystick or mouse.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
4TH & INCHES Accolade, Inc. 550 S. Winchester Blvd., #200 San Jose, CA 95128 (408) 985-1700 $30–$45 ©1987	Fast-paced, easy-to-play football action game. One to two players control teams, choosing formations, strategic options, and plays. Using joysticks, gamers control key players. Not a significant sports arcade game, but fun for ages 10 and above. —DELSON	Reviewed on C 64/128. Also for 512K Amiga, 512K Apple IIGS, 256K IBM PC, 512K Macintosh. Joystick or mouse.	Y	★ ★	★	★ ★	★	E	★
MINI-PUTT Accolade, Inc. 550 S. Winchester Blvd., #200 San Jose, CA 95128 (408) 985-1700 $30–$35 ©1987	Have some good old-fashioned fun at four of the best miniature golf courses around. Be warned, however: they're tougher than any minicourses I've ever putted through. (Don't play with your regular golfing buddies.) Cute graphics, but quite frustrating. —ROSTON	Reviewed on C 64/128. Also for 512K Amiga, 256K Apple IIGS, 512K Atari ST, 256K IBM PC. Joystick or mouse.	Y	★ ★	★ ★ ★	★ ★	★ ★ ★	A	★ ★
NBA Avalon Hill Game Company 4517 Harford Road Baltimore, MD 21214 (301) 254-9200 $40 ©1987	Requires no hand–eye coordination, only a knowledge of basketball and the ability to plan court action. One or two players choose from a roster of famous teams and plan each game's play-by-play. For statisticians only—minimal time spent watching basketball. —DELSON	Reviewed on C 64/128. Also for 64K Apple, 128K IBM PC.	Y	★ ★	★ ★	★	★	A	★ ★
PROJECT STEALTH FIGHTER MicroProse Software 180 Lakefront Drive Hunt Valley, MD 21030 (301) 771-1151 $40 ©1987	The most complex flight simulator/war game to date. Players must master several hand–eye and strategic skills in order to succeed in a group of dangerous, behind-enemy-lines missions simulating hypothetical cold war and W.W. III scenarios.† —DELSON	Reviewed on C 64/128. Also for 256K IBM PC. Joystick.	Y	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★	D	★ ★ ★
SONS OF LIBERTY Strategic Simulations, Inc. 1046 N. Rengstorff Ave. Mountain View, CA 94043 (415) 964-1353 $35–$40 ©1987	Simulates three famous American Revolution battles: Bunker Hill, Monmouth, and Saratoga. Games are short, require overall planning, and give good feel for the period. Familiarity with SSI's American Civil War play system is helpful to get started. —DELSON	Reviewed on 48K Apple. Also for 48K Atari, C 64/128, 256K IBM PC.	Y	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★	D	★ ★ ★
2400 A.D. Origin Systems, Inc. 136 Harvey Road Londonderry, NH 03053 (603) 644-3360 $40 ©1987	In the faraway future on the planet XK-120, you'll interact with more than 100 characters as you seek and deactivate the computer that controls the merciless robot police force. Spectacular graphics, sound, and animation. Another winner from Chuck Bueche of *Ultima* and *Car Wars* fame. —DONAHUE	64K Apple.	Y	★ ★ ★	★ ★	★ ★	★ ★ ★ ★	A	★ ★

RATINGS KEY **O** Overall performance: **D** Documentation: **PS** Play System: **GQ** Graphics Quality: **EU** Ease of Use: **V** Value for money: ○ Poor: ★ Average: ★★ Good: ★★★ Very Good: ★★★★Excellent: N/A Not Applicable: E Easy: A Average: D Difficult: **CP** Copy Protected, yes or no: † Longer review follows chart

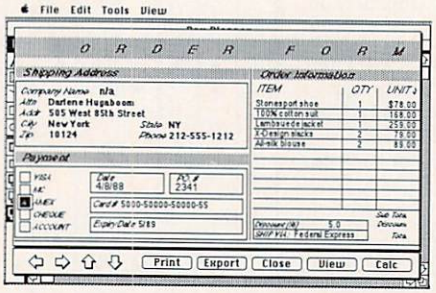
SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 63 for information such as copy protection and addresses of software publishers.

BUSINESS & PRODUCTIVITY

Fast Forms

HARDWARE REQUIREMENTS: 512K Macintosh
PUBLISHER: Shana Enterprises Inc., (403) 463-3330
PRICE: $149
OVERALL RATING: Excellent



Take a look at *Fast Forms* for the Macintosh—a personal tool kit for creating forms, printing them, collecting data, and exporting that data to other applications, such as databases, word processors, or spreadsheets.

The *Fast Forms* box holds three disks that contain a drawing program, desk accessory (DA), and dozens of sample forms.

You use the drawing program to create, modify, and print stunning form designs. The desk accessory lets you call these prepared forms to the screen whenever you need them, from within any application. Suppose you're working on a spreadsheet when the phone rings. By using the *Fast Forms* DA, your telephone message form pops up at the click of the mouse.

The drawing environment is *Fast Form*'s focal point. This collection of drawing tools (such as ovals, lines, and boxes), pattern fill options, and other object-oriented features make fancy form creation a breeze. There are rulers, margin makers, and other alignment aids that take the frustration out of form design.

But drawing is only part of any form. *Fast Forms* lets you create fields that hold and format data you input. You can also set up computed fields that show the results of other fields' calculations. For instance, given starting and ending odometer readings, *Fast Forms* could automatically fill out a "Miles Traveled" blank on your expense form.

You can control the format of data—for example, dollar signs, commas, or text only. Using your Mac's system clock, the program will automatically fill in the current date and time. It's also possible to define default entries, so that if most of your phone numbers are in Chicago, for instance, the 312 area code would be entered unless you told the program otherwise.

With a scanner, you can scan preprinted forms (such as Federal Express air bills) into your computer and then add fields for collecting data. If you want, *Fast Forms* will print only the entered data and not the form itself. This makes it easy to create a template for quickly filling in preprinted forms.

You can export data to a database program automatically or be prompted about deciding where to export whenever you fill out or print a form. Data from *Fast Forms* will work in several "foreign" programs, including *dBase Mac* and Microsoft's *Word*, *Works*, or *Excel*.

The 142-page manual is almost top-notch and includes a tutorial, reference section, and a quick-reference section. There's also a glossary and a skimpy, but usable, index. Unfortunately, the table of contents is only 11 lines long and nearly useless. The sample forms are helpful examples of proper technique for designing forms and can be easily modified for your own applications. You can use *Fast Forms* with an ImageWriter, but a laser printer really makes it shine.

A program such as *Fast Forms* puts form creation into the hands of the masses. It's a keeper. I would have less gray hair today if I'd discovered it sooner. —RON MANSFIELD

Lucid 3-D

HARDWARE REQUIREMENTS: 256K IBM PC
PUBLISHER: Personal Computer Support Group, (214) 351-0564
PRICE: $149
OVERALL RATING: Excellent

For a new spreadsheet to climb into the ring with today's heavyweight competitors and survive, it must either be muscular enough to outdo the others with greater size and speed or clever enough to do the unexpected. The creators of *Lucid 3-D* have clearly chosen the latter course. Their new spreadsheet doesn't have the power features needed to deliver a knockout blow to such programs as Lotus *1-2-3* or Microsoft *Excel*, but it does make points on smarts. It does things the others simply can't do—and does them with enough slickness and style to make it a winning choice.

The first major departure from business-as-usual spreadsheet performance is the fact that *Lucid 3-D* can be run as a memory-resident program. It waits in the background as you use your other software and, with a single key press, pops up onscreen. What turns this from a clever bit of programming into a really useful feature is its capability to freely cut and paste information from the spreadsheet into your other applications and vice versa. I can work in my favorite word processor, pop *Lucid* onto the screen to perform calculations, then cut and paste data (up to a screenful at a time) from the worksheet into my document.

Despite the fact that *Lucid 3-D* consumes little memory (from 113K to 165K), it packs a solid range of features, including 51 built-in functions and powerful macro capabilities. All of the basic mathematical and financial functions are included, and table lookup and calendar arithmetic are handled exceptionally well. Windows for nine different worksheets can be open simultaneously, or you can display two views of different sections of the same worksheet.

The second innovative concept incorporated in *Lucid 3-D* is the ease of using multiple spreadsheets in a three-dimensional relationship. Imagine worksheets stacked sandwich-style. Any cell in the top worksheet can carry over data from a cell in the worksheet below it. Moving back and forth between related spreadsheets is simple, and there is no theoretical limit to the number of layers you can employ.

What purpose does this 3-D orientation serve? Here's one example: If you are building a system to track company sales, your top worksheet could be a summary of sales figures

Easy Working™
From Spinnaker

Easy Working™ is a line of high quality, low cost personal productivity programs designed for the person who wants to spend time doing useful work, not struggling with complex computer commands and long manuals. Each Easy Working product is carefully designed to work alone or in combination with other members of the Easy Working family.

On-screen menus provide "at-a-glance" summaries of the features of the program. When you select a feature from the menu bar, a menu drops down to show all of the available options. Every command available is displayed in the drop-down menu. You will find that you will spend less time getting to know the program and more time on your projects. And since each member of the Easy Working family uses the same command structure, once you learn how to use one, you'll find a head start on learning to use the other two. But don't be fooled. Easy doesn't mean incomplete. Easy Working products are full-featured.

Easy Working™: The Writer™:
Complete word processing features allow you to create your letters and reports and arrange them to suit your needs, includes 100,000 word spellchecker. Editing functions include insert, delete, cut, paste, and copy.

Easy Working™: The Filer™:
A multi-purpose program which simplifies the storage, selection, and reporting of information. Maintain or create mailing lists, inventories, club memberships, and other types of information.

Easy Working™: The Planner™:
The Planner provides you with all of the professional features of an electronic spreadsheet. Extensive mathematical operations easily create your spreadsheet for budgeting, tax calculation, expense reports, financial statements, and other applications.

The Writer, The Filer, and The Planner fully integrate with each other.

Available at fine software dealers or for orders only call:

1-800-826-0706
Others call: (617) 494-1200

Apple II+, IIe, IIc	$9.95
Commodore 64/128	$9.95
IBM/PC/AT	$9.95

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Spinnaker Software, Corp., One Kendall Square, Cambridge, MA 02139

CIRCLE READER SERVICE 28

broken down by region. Each cell containing a regional total could then "open up" to reveal a separate worksheet summarizing each salesperson's performance within that region. Each cell containing a salesperson's total on that second worksheet could then open up to a third worksheet that reveals the individual salesperson's results for each account. By stacking and linking worksheets in this way, you can move quickly from scanning an overview of company-wide sales results to checking whether Joe Mahoney in Cleveland finally closed the Terwillinger Industries contract. And when the Terwillinger deal is finally inked, the new figures can be entered on the appropriate worksheet, and the totals in the linked sheets will be updated automatically.

Additional features abound. Mouse users will be pleased with the way they can manipulate a *Lucid 3-D* worksheet with their desktop rodent (there are keyboard equivalents to accomplish the same tasks). My only complaint is the inability to scroll horizontally or vertically through a worksheet using the mouse. A text note can be attached to any cell in your worksheet. In fact, these notes can be up to five pages long, allowing you to write and print entire memos or letters from within *Lucid*.

One potential sticking point is Lotus *1-2-3* compatibility. The program will not directly read *1-2-3* files. Instead, a utility is included to translate *1-2-3* worksheets to *Lucid* format and vice versa. As long as your *1-2-3* file doesn't use any of the relatively obscure functions not supported by *Lucid*, this shouldn't pose much of a problem, although it is an extra step that programs such as *Excel* handle automatically. Also, if graphing figures is a favorite pastime, you'll have to look elsewhere: *Lucid* has no graphing capabilities.

Lucid 3-D will fit certain approaches to working better than more traditional spreadsheets will. For those who boot up their computers primarily to use spreadsheets and rarely leave these applications for others, *Lucid* offers the capability to keep many worksheets on-screen simultaneously, a handy built-in notepad for correspondence, and a system of layered worksheets that can improve your work's organization and structure. Those of us who jump between applications will find *Lucid* particularly appealing for its pop-up capability and the ease of transfer of information between the spreadsheet and word-processing or database programs.

—STEVE MORGENSTERN

Personal Newsletter

HARDWARE REQUIREMENTS: 128K Apple, C 64/128
PUBLISHER: Softsync, Inc., (212) 685-2080
PRICE: $50–$60
OVERALL RATING: Excellent

Publish It!

HARDWARE REQUIREMENTS: 128K Apple, 512K IBM PC
PUBLISHER: Timeworks, Inc., (312) 948-9200
PRICE: $100–$150
OVERALL RATING: Excellent

The appropriate desktop-publishing software can help any small business advertise itself and create the same quality product as its larger competitor. Two new programs give you the power to publish quickly, easily, and attractively. Both are contenders, but they approach the work of page layout with individual styles. How do they compare on the Apple II?

Overview. Softsync's *Personal Newsletter* is easy to learn and feels comfortable immediately. A command line displays options as you choose from menus and submenus to design your page and add text and graphics.

You use the keyboard for everything. For instance, with the Apple II version you hold down the Solid Apple key and tap W to create *windows* (these will be your columns). Tap A to *add* a column. Good mnemonic choices. Then type in text or import it from any ASCII file.

Publish It! from Timeworks has the look and feel of new technology. You use a mouse (or joystick) for "point and click" features. As on the Macintosh or with Microsoft *Windows* on an IBM PC or compatible, *Publish It!* features pull-down menus, toolboxes, scroll bars, and dialog boxes. Don't expect the same power and speed as you would with *PageMaker* or any other top-level desktop-publishing package; but you can produce newsletters with *Publish It!* in virtually no time.

Learning Curve. *Personal Newsletter* is easier to learn, and the manual, which includes several tutorials, is easier to follow. Ultimately, *Publish It!* is easier and faster to use because of the mouse and its point-and-click capabilities.

Graphics. *Personal Newsletter* includes its own pictures and imports *Dazzle Draw*, *Newsroom*, *Print Shop*, or any single or double hi-resolution graphics that have been converted to ProDOS. To use any graphics other than its own with *Publish It!*, you must first convert to ProDOS and then save the graphics as double hi-res screens—a more tedious process. *Personal Newsletter* also offers more sophisticated drawing tools, such as fat and small bits and horizontal and vertical flip, but *Publish It!* has a fine-tuned resizing ability.

Text. Both programs let you type, insert, delete, cut, copy, and paste text. Both support WYSIWYG ("what you see is what you get"), word wrap, and the ability to flow text around graphics and from column to column. *Publish It!* also supports search-and-replace and hyphenation. However, when you type, be prepared for a very slow response time.

Both allow you to import text from other places. With *Personal Newsletter*, you must store your file as unformatted ASCII text, but *Publish It!* also reads *AppleWorks* and *Bank Street Writer* files directly.

Fonts. *Personal Newsletter* doesn't show you font samples in the manual, so until you've tried them all, you're selecting without real knowledge. In addition, to get large headlines for your articles, you type them in graphics mode and move them separately from text. *Publish It!* offers a larger variety of fonts and sizes that *are* shown in the manual. For a headline, just choose a larger size of the current font. *Personal Newsletter* allows just one font per document in text mode (a limitation that guarantees a clean, balanced look), although you can add more fonts in graphics mode. *Publish It!* lets you mix and match all available fonts.

Screen. Both programs show your page as you work. With *Personal Newsletter*, you see about a third at a time, and you use cursor keys to move around. *Publish It!* offers scroll bars to choose a portion of the page for viewing; and you can see the whole page at once or work in half, full, or double size.

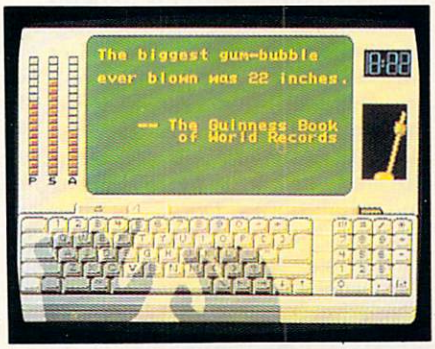
Printing. Each time there is a change in font when printing with *Publish It!*, the correct disk must be in a drive or you're prompted to insert it. *Publish It!* gives you more choices of page sizes—letter, legal, and the international A4 and B5 sizes—than *Personal Newsletter* does. Sadly, neither package currently supports laser printers. However, Timeworks will be offering a utility for laser printing with *Publish It!* (to be sold separately), while the publishers of *Personal Newsletter* plan on including laser support in later versions.

For people like me, who need to publish newsletters, the capabilities we've been waiting for are finally here, and there's a choice. I used both programs to produce separate versions of the same document and found that the end results didn't prove one program better than the other. *Personal Newsletter* was initially easier to learn and to use, but *Publish It!* felt more comfortable once I practiced. Whichever you choose, you'll never create a newsletter by hand again. —GWEN SOLOMON

EDUCATION & CREATIVITY

Mavis Beacon Teaches Typing!

HARDWARE REQUIREMENTS: 512K Amiga, 64K Apple, 48K Atari, C 64/128, 256K IBM PC, 512K Macintosh
PUBLISHER: The Software Toolworks, (818) 907-6789
PRICE: $40–$50
OVERALL RATING: Excellent



I'll miss my daughter, Laurel, when she goes to college this fall—and she'll miss me. I type all of her papers. She's been too busy taking college prep classes to bother with a business course and hates computerized-typing tutors. When I coaxed her to try *Mavis Beacon Teaches Typing!*, she was dubious. To my surprise, she was still typing busily away an hour later.

"What's the difference?" I asked.

"It lets me type real words and phrases right away instead of nonsense," was the prompt reply. "It gives me new letters faster, so I feel like I'm getting somewhere, and it doesn't just give me more exercises when I feel frustrated."

Mavis Beacon may succeed in teaching Laurel to type where other programs have failed because of a strong dose of artificial intelligence. Unlike other typing programs, *Mavis* immediately recognized that Laurel has had some experience with the keyboard and quickly adjusted to the appropriate level. It then provided interesting material to type, geared to Laurel's age level. Instead of presenting drill after drill, *Mavis* selected from a collection of 30 lessons aimed at solving specific problems. *Mavis* is flexible and can generate new lessons if those currently in stock don't meet a student's needs.

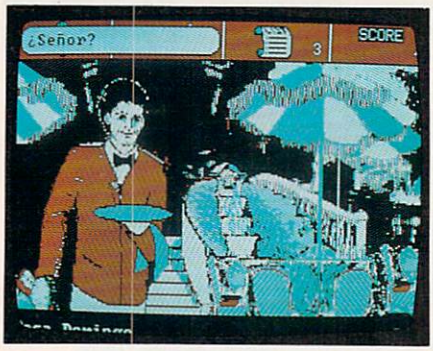
Mavis comes with all kinds of extras. A clock and metronome help you build speed and rhythm, and on-screen meters monitor your progress. Shadowy hands show you which finger goes where—a helpful feature missing from most other programs. Dozens of graphs show you exactly where you need the most work. Flexible options allow you to turn off the beep that accompanies wrong keystrokes and let you try the Dvorak instead of the QWERTY keyboard layout. The snappy manual includes typing exercises and several business-letter formats. As a graduation present, *Mavis* provides an on-disk resumé-writing program that asks you questions about yourself, then creates and prints a resumé.

Mavis Beacon bills itself as "the finest typing tutor in the world." As usual, *Mavis* is right on key.

—TAN A. SUMMERS

Ticket to Spain

HARDWARE REQUIREMENTS: 128K Apple, C 64/128, 128K IBM PC
PUBLISHER: Blue Lion Software, (617) 876-2500
PRICE: $30–$40
OVERALL RATING: Very Good



It was no accident that my 15-year-old daughter was the prime reviewer for this package; she's the one member of the household presently enrolled in a Spanish class. We quickly determined that Doña's one semester of Spanish, A's and B's notwithstanding, was far from sufficient for playing the educational game entirely in Spanish. However, it did assist her in answering some of the Spanish trivia questions asked during play and in moving quickly through the phrase book when she was in need of a translation.

Designed as an interesting way to learn a little about the country as well as the Spanish language, *Ticket to Spain* is a "quest" type adventure. The player becomes the protagonist in a scenario, seeking an heirloom left by a Spanish ancestor. In the course of the quest, the player must fulfill eight tasks, such as "buy a plate," "taste some codfish," or "see the gardens of Boabdil." Fulfilling tasks requires locating your destination on a map, negotiating bus and train schedules or the public roads, staying at hotels, sleeping, waiting for merchants to open their shops, and completing tasks in order.

I played along with my daughter and found the program challenging. She patiently sought clues to her various tasks in the phrase book and the user handbook, which contains a brief overview of the places to visit. After successfully completing the game in a little more than two-and-a-half hours, Doña's criticisms were few, but critical to her willingness to play again.

In order to find a city and travel to it, one must know where it is. An on-screen map is available for reference, but Doña wanted one beside her as she worked. Ditto the phrase book; she didn't find it adequate and wound up making many guesses when asked questions that required translations. History and political questions were also difficult for her (and me) to answer, and we decided a Spanish almanac would have been a big help. Both these objections were overcome by investing in a Spanish-English dictionary and opening the world atlas.

Her second complaint, however, is one worth considering. The graphics, she moaned, are BORING. Repetitive, not particularly striking, and static (my interpretation of her adolescent adjectives)—and not helped much by the use of sound, primarily in the form of a repetitive "theme" song. It's unfortunate that such an entertaining and educational program would be judged on its graphics, but if young adults are part of the intended market, that should be taken into consideration.

A plus that both Doña and I liked was the ability to leave the program and save your status, returning to your original position when you resume play. When you have completed a round successfully, the program saves your score and presents you with a different set of tasks at the next session. A pause option is also very useful, especially when you become so involved in reading the almanac that you forget the clock is ticking away!

—MARLENE BUMGARNER ELTGROTH

ENTERTAINMENT

Project Stealth Fighter

HARDWARE REQUIREMENTS: C 64/128, 256K IBM PC
PUBLISHER: MicroProse Software, (301) 771-1151
PRICE: $40
OVERALL RATING: Excellent

Sometimes, simulations of military hardware, particularly flight simulators, seem as complex as the real thing. Nowhere is this more evident than in MicroProse's new flying combat game, *Project Stealth Fighter*.

Perhaps the most ingenious and certainly the most difficult flight simulator to date, this program, which simulates the ultra-secret American fighter plane designed to strike deep behind enemy lines with the least chance of detection, is not for the "just boot and play" gamer. It requires hours of patient practice.

The work pays off in consistent edge-of-your-seat thrills. There are various missions in such places as Libya, Eastern Europe, the Persian Gulf, and the rough terrain of Scandinavia's borders with the Soviet Union. You set the level of play and opposition, type of armament, and world political situation to give your mission a greater degree of complexity and allow you to truly personalize the game. There's a role-playing element at work here as well.

The core of the simulation is your plane, a supersophisticated F-19 stealth fighter. Already nearing legendary status because of its ability to elude detection by most ground observers, electronic and human, the stealth fighter is difficult to fly but a joy to maneuver once you learn its strengths and weaknesses.

Project Stealth Fighter is not for the casual gamer. It requires dedication and patience to master, but "zowee"—what a kick! It's sufficient to say this is the most sophisticated flying simulator I've ever encountered.

—JAMES DELSON

THE PROGRAMMER

CONTENTS AND COVERAGE

FYI
Page 83
Throughout The Programmer, find news for programmers, information about our programs, and "Tips to the Typist."

PRODUCTIVITY
Page 72
Handle mass mailings and much more with our *Mailing Labels* program.

FUN & GAMES
Page 80
Do you have what it takes to be a race car driver? Check out our *Wreckless Racer* program and find out!

Computers†	Mailing Labels	Wreckless Racer
APPLE II/PLUS/c/e/GS		★
COMMODORE 64/128		★
IBM PC & COMPATIBLES	★ p	★ c
MACINTOSH		★

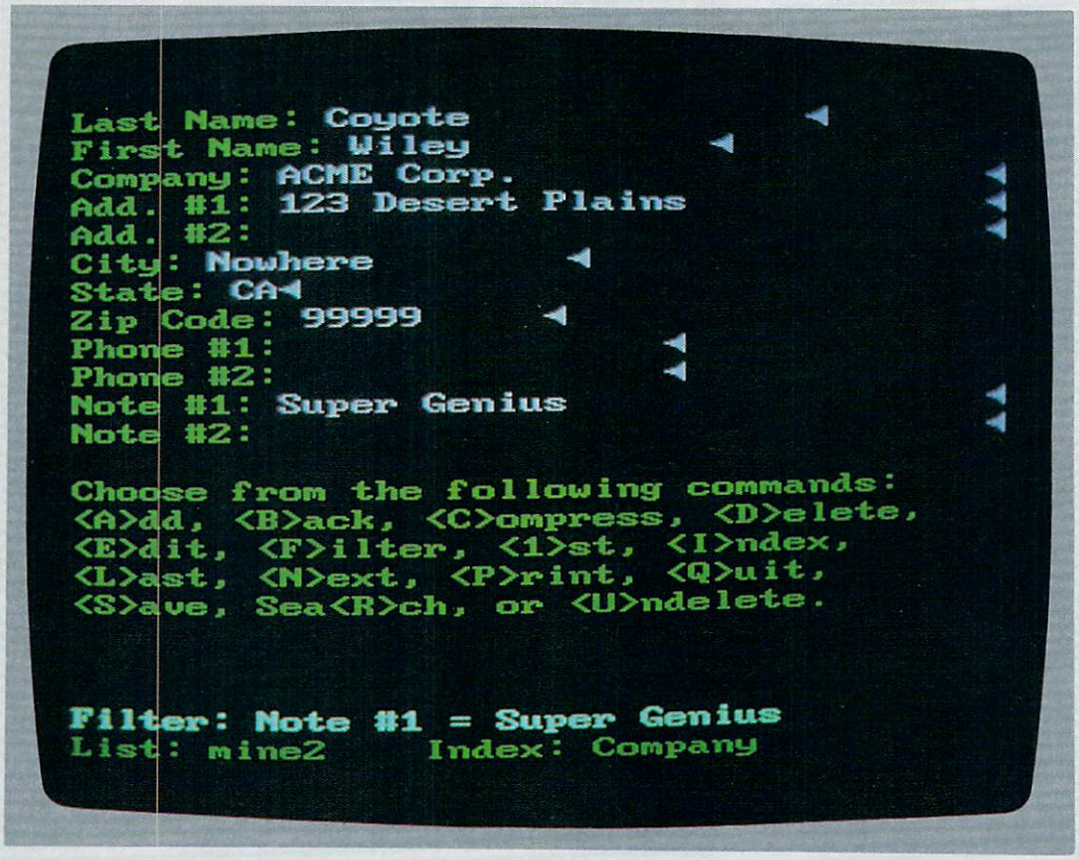
KEY: ★ Program in this issue for this computer. † See page 79 for specific models c Color monitor recommended. p Printer recommended.

ILLUSTRATION BY BARTON STABLER

MAILING LABELS

HANDLE MASS MAILINGS—AND MORE—WITH EASE

BY PASQUALE M. CIRULLO



EDITOR'S NOTE: *This month, we're featuring the IBM version of* Mailing Labels. *Next month, we'll be presenting the Apple version.*

Whether you're a small businessperson accumulating 1,000 names for a direct-mail campaign or the custodian of your family's 50-name Christmas card list, *Mailing Labels* can make your job easier.

Even if you already own a database program, you may still find our program handy for what it does best: printing name-and-address labels in a variety of formats, in any order, and from all or any part of your file.

For example, it's easy for *Mailing Labels* to print labels in this format:

John Q. Public
2345 Main Street
Anytown, ME 02134
ATTN: Mr. Public—Immediate Reply Requested

or envelopes that look like this, from the same database file:

The Home-Office Shop
P.O. Box 890
San Andreas, CA 99999

You can print labels in alphabetical order for all of the names in your database . . . or, say, in numerical order, according to zip codes, for all customers who have unpaid balances.

If you have no other database program, you'll find that *Mailing Labels* is flexible enough to serve other purposes, such as a Rolodex-type phone book or even a to-do list.

To use *Mailing Labels*, type in the program in BASIC and SAVE it. Because of its length, the program should be carefully typed in. When you are ready to use *Mailing Labels*, LOAD it into BASIC and RUN it.

Give the program a trial run first. Enter a half-dozen names and try all the functions. This way, if you've made any typing errors and the program doesn't work properly, you won't lose anything important.

USING *MAILING LABELS*

When you run the program, a menu with three choices will appear on the screen: ‹S›tart a new mailing list, ‹U›se an existing mailing list, and ‹E›xit the program. You can choose any option by pressing the first letter of that option.

‹S›tart a new mailing list will allow you to create a new mailing list on your disk. You will first be asked for a name for the mailing list. This name can be up to eight characters long and cannot contain an extension (such as .LST). *Mailing Labels* creates two files with the same name but with different extensions. If you choose a

name that is already used, the computer will tell you and ask if you want to ‹O›verwrite the file or ‹L›oad the file. If you don't want to do either, press any other key, and you will return to the main menu. If you are unsure of what names you have already used, enter a question mark (?) when you're asked for the name and the computer will give you a directory of all the names on any disk you specify. If you do not want to start a new file, just press ENTER when asked for a file name.

‹U›se an existing mailing list will load a file from your disk and allow you to perform any of the functions described below. Again, if you do not remember the names of your files, enter the question mark (?), and the computer will give you a directory. If you do not want to load a file, just press ENTER when asked for the name.

‹E›xit the program will return you to BASIC.

ENTERING NAMES

When you choose ‹S›tart a new mailing list, you will be at the Add screen, and the cursor will be at the Last Name field. Here you can type in Last Name, First Name, Company, a two-line street Address, City, State, Zip Code, two Phone numbers, and two Notes. Fill in the Last Name and any information you want, and then press ENTER to go on to the next person. *(See "Using the Editor" for information on the keys you may use while adding names.)*

The names can be added in any order, because the program automatically arranges them alphabetically by last name; you can change the order later *(see ‹I›ndex command, below)*. You can only enter up to 1,000 names into a mailing list file.

When you have finished adding names, press ENTER on a blank Last Name line, and the program will bring you to the Command Screen.

THE COMMAND SCREEN

If you choose ‹U›se an existing mailing list, the program bypasses the Add Screen and brings you directly to the Command Screen. The Command Screen displays the current record (a single person's name and other information). If you've marked this record for deletion, there will be a message stating so.

Below the record appears a list of all the commands that you may use. At the bottom of the screen is the name of the mailing list that you are working on and the field (line) on which the list is indexed, or sorted. Also, if you have a filter set *(see below on how to set a filter)*, it will also be displayed.

To choose a command, press the letter that appears in the angled brackets (‹ ›). For instance, if you want to ‹A›dd, press the A key, and to Sea‹R›ch, press the R key. Here's an explanation of what each command does:

‹A›dd. Allows you to add more names to the current list, in the same manner you did when you chose to ‹S›tart a new mailing list. The only difference here is that the new names will be inserted into the file according to the current index, which may not be the Last Name. *(See "Using the Editor" for information on the keys you may use while adding names.)*

‹B›ack. Displays the previous name in the list. If you are already at the first name or if there are no names before the current one that match the filter *(see ‹F›ilter)*, the program beeps.

‹C›ompress. Removes all the names that you have marked for deletion. This frees the space taken up by these names for use by others.

‹D›elete. Marks a name for deletion. If you choose this command, the program will display a message at the top of the screen saying "Marked for Deletion." However, the name isn't actually erased from the database until you choose ‹C›ompress. Until then, you can use the ‹U›ndelete command to restore the name.

‹E›dit. Allows you to make changes to any line in the current record. It is used, for instance, if a person moves and you want to change the information in his or her record. *(See "Using the Editor" for information on the keys you may use while editing names.)* If you change the information on the indexed line, the old record will be marked for deletion and a new record will be created. Otherwise, the changes are made to the current record.

‹F›ilter. Allows you to look at or print certain names in the file based on a criterion that you establish. For instance, if you want to see only the names of people whose last names begin with A, B, C, D, or E, you can set a filter of Last Name ‹ F. This will "filter out" all other names.

When you select ‹F›ilter, you will first be asked to either choose one of the 12 fields or Clear Filter. Clear Filter will erase any filter that was previously set and return you to the Command Screen.

After choosing the field, you must choose a relationship. The possible relationships are: = (equal to), ‹ › (not equal to), ‹ (less than), ‹ = (less than or equal to), › (greater than), and › = (greater than or equal to). After a relationship is chosen, type in the filter string to complete the filter and press ENTER. The program will then print the filter at the bottom of each screen and only display those records that match the filter.

For example, to set up the previous example (Last Name ‹ F), we would choose 1 (Last Name) for the field, 3 (‹) for the relationship, and then type in F for the filter string and press ENTER. If you want the filter to check for a blank line (for instance, State =) just press ENTER for the relationship. If you decide you don't want a filter or have chosen the wrong field or relationship, press the ESC key.

‹1›st. Displays the first record in the mailing list based on the index.

‹I›ndex. Changes the order in which the names are displayed or printed. For example, it allows you to switch from viewing in last name order to company name order. You can index on any of the lines. If you decide not to rearrange the file, either press ENTER or select the line that the file is currently indexed on.

‹L›ast. Displays the last record in the list based on the index.

‹N›ext. Displays the next record in the list. If you are already at the last name or if there are no names after the current one that match the filter, the program beeps.

‹P›rint. Lets you print the current name or all the records on mailing labels, envelopes, or plain paper. If a filter is in effect when you press P, the filter will remain in effect. For instance, if you want to print labels for only the people who live in New York state, you would set a filter for State = NY, and then go to the print section. *(See "Printing Labels" for more information.)*

‹Q›uit. Saves the current list onto your disk and returns you to the original menu.

‹S›ave. Saves the current list onto your disk.

Sea‹R›ch. Locates a particular name for you, based on the currently indexed field. For instance, if the list is indexed on Zip Code, you will not be able to search for a particular Company, only a particular Zip Code.

Search locates the first name that matches the search

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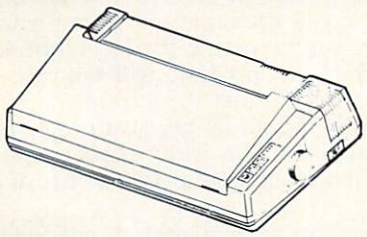

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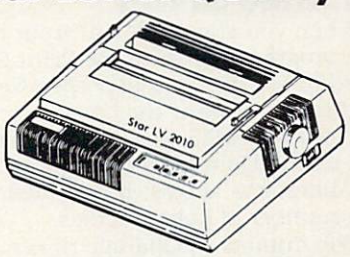

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string. For example, if you have the names Belushi, Bowman, and Brown, and you're searching for B, the program will display one of these names and then you can use ‹B›ack and ‹N›ext to see the others.

‹U›ndelete lets you change your mind about deleting a record before you compress the list.

REMEMBER . . .

To minimize problems when saving or loading files, keep your mailing lists on a separate disk from your programs and from each other, and always keep a disk in your disk drive when using the program. Remove the disk only when you have exited the program.

When asked for a file name, don't use more than eight characters and don't use an extension.

Be sure to keep a backup copy of your files to minimize problems if something happens to them.

And, always leave the program through the ‹E›xit the program option of the initial menu, or some or all of your data may be lost.

USING THE EDITOR

Whenever you choose to ‹S›tart a new mailing list, ‹A›dd, or ‹E›dit, the program enters the Editor, and only certain keys will work.

The BACKSPACE key deletes a character to the left of the cursor. To move the cursor from one line to another, use the UP–ARROW and DOWN–ARROW keys (not the ENTER key).

If you make an error in typing, you can move back and forth on the line by using the LEFT–ARROW and RIGHT–ARROW keys. You can also switch between Insert mode and Overtype mode by pressing the INSERT key. (If you aren't familiar with these modes from word-processor experience, try them and you'll soon understand the difference.)

Finally, only use the ENTER key when you are finished entering the record and want to move to the next record. In Edit mode, pressing ENTER will redisplay the Command Screen.

PRINTING LABELS

When you choose ‹P›rint from the Command Screen, the program will go to the Print Screen. This screen is used to tell the computer the size of your mailing labels and how you want the labels printed.

First, you will be asked to describe the labels that you are using. Do this by telling the computer the number of Characters across, the number of Lines down, and the number of Labels across.

The number of Characters across is the number of characters from the first character of the first label to the first character of the next label on the same row. The number of Lines down is counted from the first line of a label to the first line of the next label below. The number of Labels across is the number of labels on one line across the width of the paper. The program will not allow more than 99 Characters across, 20 Lines down, and 4 Labels across. If you type 0 on any of the lines, the program will return you to the Command Screen.

For example, if you are using labels that are 20 characters across, 10 lines down and only 1 label across, you would type the three numbers 20, 10, and 1 on the screen.

Once you have entered valid numbers for the label size, the program enters the Template Screen. Here is where you tell the computer how you want the labels printed. On the left side of the screen is a list of all the data lines or fields (Last Name and First Name, for instance) with numbers before them (these numbers represent these specific fields). You will use these numbers to lay out the label. On the right side of the screen is a list of letters, each one standing for one line on the label. To lay out the label, you type the number of the field you want printed on the appropriate line of the label. If you want to print more than one field on a single line of the label, the field numbers must be separated by a plus sign (+). You can also have a message or any other text printed on all the labels by typing that text on a label line. If you want a field or fields to print on the same line as your message, it must be separated from the message (and from other fields on the same line) by a plus sign.

Using the labels from the above example, you could print a label to look like this:

```
Attention: Wiley
Wiley Coyote
ACME Corp.
123 Desert Plains
Nowhere, CA 99999
```

The template would be typed in as follows:

```
a
b
c  Attention: +2
d
e  2+ +1
f  3
g  4
h  6+, +7+ +8
i
j
```

Press ENTER on any line you want to remain blank. Pressing ESC at any time will abort the printing and return you to the Command Screen. If you make a mistake on a line, you will have to retype the label again. You cannot edit a line of the template.

After you type in the template, the program will show you how the current record will be printed and ask if it is correct. If it is not correct, the program will return to the Template screen for you to retype the label format.

Once the label is correct, the program will ask you two questions: 1.) Do you want just the current name or all the names printed? and 2.) Do you want to start by printing the template? (You may want to say yes to this question in order to save the template for future reference.)

Once these questions have been answered, put the labels in your printer, and set it for the type size, style, and mode you want. (Depending on your printer, you may have to do this before running *Mailing Labels*; check your printer manual to find out how.) Press ‹Y› to begin printing. If you do not wish to print the labels at this time, press any other key besides the ‹Y›.

CUSTOMIZING *MAILING LABELS*

You can change the name and length of each data line to suit your particular needs very easily. Lines 16500–17020 are the length and label of each field. If you change these lines, there are a few rules that need to be followed:

1. Make sure that each item in a DATA statement is separated from the next by a comma (,).

2. Never remove a data item without replacing it with something else.

3. Always make sure that line 16500 has 12 numbers

on it. If it doesn't, the computer will give you a "Type Mismatch Error."

4. Always make sure that lines 17000–17020 contain 12 labels. If not, the computer will give you an "Out of Data Error."

5. Make sure that the length of the field plus the length of the label do not exceed 37. If they do, the computer display will be double-spaced, and some of the instructions will overwrite your records. Also, the Editor will not work properly.

IBM PC & compatibles/*Mailing Labels*

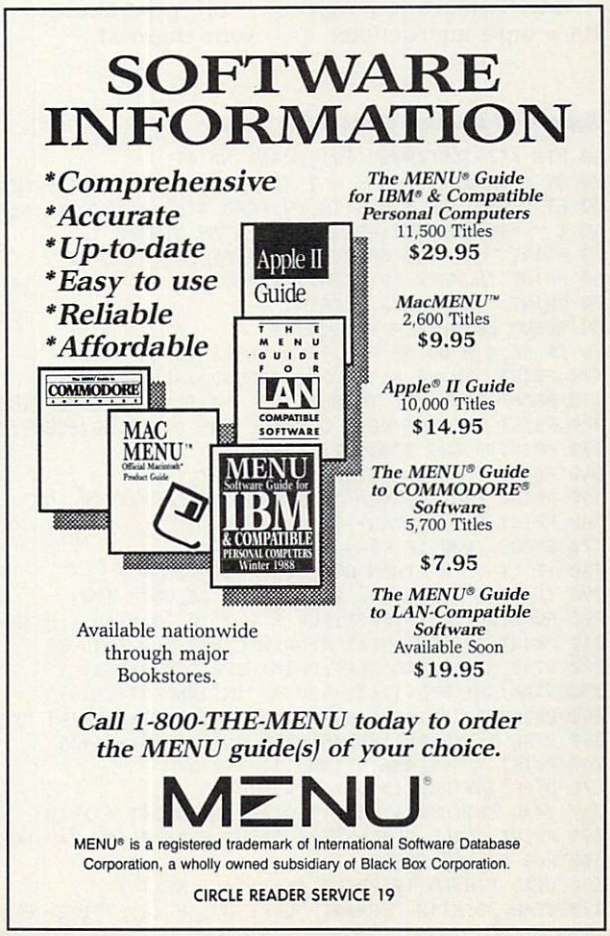
```
10 DEF SEG=&H40:V=(PEEK(&H10) AND 48)
20 IF V=32 THEN WIDTH 40
30 DEF SEG:KEY OFF:LOCATE ,,0:SCREEN 0,0
40 DIM CO(12),H(3),L(12),P(1000,3),RO(12),FR$(6)
50 DIM HS$(3),LB$(12),MD$(1),ML$(12),NI$(1000,2)
60 DIM PS$(3,20),PT$(5,20),RF$(12)
70 FOR X=1 TO 12:RO(X)=X+2:READ L(X):NEXT X
80 FOR X=1 TO 12:READ LB$(X):CO(X)=LEN(LB$(X))+2
90 NEXT X:FOR X=1 TO 3:READ HS$(X):NEXT X
100 FOR X=1 TO 6:READ FR$(X):NEXT X:SP$=CHR$(32)
110 BL$=STRING$(39,32):F$="":R$=CHR$(13)
120 MD$(0)="INSERT"+SP$+SP$:MD$(1)="OVERTYPE"
130 ON ERROR GOTO 8500
140 IN=1:DN=1:SN=1:NF=-1:IV=0:MM=-1:VT=FRE(A$)
150 CLS:LOCATE 4,15:PRINT "Welcome to":LOCATE 6,10
160 PRINT "Mailing List Manager":LOCATE 8,1
170 PRINT "Do you want to...":PRINT
180 PRINT "<S>tart a new mailing list,"
190 PRINT "<U>se an existing mailing list, or"
200 PRINT "<E>xit the program?"
210 GOSUB 9000:ON INSTR("SUE",ZS$) GOTO 230,360,580
220 SOUND 400,2:GOTO 210
230 CLS:LOCATE 6,1:PRINT "Enter name for new file"
240 INPUT "(without extension): ",F$:IF F$="" THEN 150
250 IF F$="?" THEN GOSUB 9500:GOTO 230
260 OPEN F$+".SEQ" FOR INPUT AS #1:CLOSE 1
270 LOCATE 6,1:PRINT "This file already exists."
280 PRINT "Do you want to <O>verwrite or <L>oad"
290 PRINT "this file.";:GOSUB 9000:PRINT ZS$
300 IF ZS$<>"O" AND ZS$<>"L" THEN 140
310 IF ZS$="L" THEN 390
320 FOR X=1 TO 1000:NI$(X,1)="":NI$(X,2)="":P(X,1)=X+1
330 P(X,2)=0:P(X,3)=0:NEXT X:G=1:P(1000,1)=0
340 SN=1:IN=1:NR=0:GOSUB 10000:GOSUB 10500:GOSUB 11000
350 IF NR=0 THEN CLOSE:GOTO 140 ELSE 450
360 CLS:LOCATE 6,1:PRINT "Enter filename (without"
370 INPUT "extension): ",F$:IF F$="" THEN 140
380 IF F$="?" THEN GOSUB 9500:GOTO 360
390 CLS:LOCATE 12,8:PRINT "Loading; please stand by."
400 MM=0:OPEN F$+".SEQ" FOR INPUT AS #1
410 INPUT#1,SN:INPUT#1,G:INPUT#1,IN:INPUT#1,NR
420 FOR X=1 TO 1000:INPUT#1,NI$(X,1):INPUT#1,NI$(X,2)
430 FOR Y=1 TO 3:INPUT#1,P(X,Y):NEXT Y:NEXT X
440 CLOSE 1:GOSUB 10000
450 MM=0:GOSUB 4000
460 GOSUB 10500:GOSUB 11500:LOCATE 16,1:COLOR 2
470 PRINT "Choose from the following commands:"
480 PRINT "<A>dd, <B>ack, <C>ompress, <D>elete,"
490 PRINT "<E>dit, <F>ilter, <1>st, <I>ndex,"
500 PRINT "<L>ast, <N>ext, <P>rint, <Q>uit,"
510 PRINT "<S>ave, Sea<R>ch, or <U>ndelete."
520 COLOR 7:GOSUB 9000
530 IF ZS$="Q" THEN GOSUB 7000:CLOSE:GOTO 140
540 Z=INSTR("ABCDEF1ILNPSRU",ZS$)
550 IF Z=0 THEN SOUND 400,2:GOTO 520
560 ON Z GOSUB 1000,1500,2000,2500,3000,3500,4000,4500
,5000,5500,6000,7000,7500,8000
570 IF SN>NR THEN CLOSE:GOTO 320 ELSE 460
580 CLOSE:CLS:KEY ON:ON ERROR GOTO 0:END
999 REM --ADD A RECORD--
1000 NF=-1:GOSUB 10500:GOSUB 11000:REC=DN
1010 GOSUB 12000:RETURN
1499 REM --BACK--
1500 D=DN
1510 Z=P(D,1):IF Z=0 THEN Y=D:GOTO 1530
1520 IF P(Z,2)<>0 THEN Z=P(Z,2):GOTO 1520 ELSE 1560
1530 Z=P(Y,3)
1540 IF Z=0 THEN SOUND 400,2:REC=DN:GOSUB 12000:RETURN
1550 IF P(Z,1)=Y THEN Y=Z:GOTO 1530
1560 REC=Z:GOSUB 12000:GOSUB 12500
1570 IF FF THEN DN=Z:RETURN ELSE D=Z:GOTO 1510
1999 REM --COMPRESS--
2000 GOSUB 13000:LOCATE 17,1
2010 PRINT "Compressing; please stand by."
2020 FOR X=1 TO NR:FOR Y=1 TO 3:P(X,Y)=0:NEXT Y:NEXT X
2030 VT=FRE(A$):SN=1:FOR DN=1 TO NR:X=SN
2040 IF NI$(DN,2)="*" THEN 2060
2050 IF DN=SN THEN 2090 ELSE GOSUB 14530:GOTO 2090
2060 IF DN=SN THEN SN=SN+1
2070 IF G=0 THEN G=DN:GOTO 2090
2080 P(DN,1)=G:G=DN
2090 NEXT DN:GOSUB 4000:RETURN
2499 REM --DELETE--
2500 NI$(DN,2)="*":RETURN
2999 REM --EDIT--
3000 GOSUB 13000:IF G<>0 THEN 3040
3010 LOCATE 17,1:PRINT "There is no room to edit."
3020 PRINT "Compress the file before editing."
3030 GOSUB 13500:RETURN
3040 ZS$=ML$(IN):GOSUB 14000:IF ZS$=ML$(IN) THEN 3070
3050 GOSUB 2500:DN=G:G=P(DN,1):GOSUB 8000
3060 GOSUB 14500:IF NR<DN THEN NR=DN
3070 REC=DN:GOSUB 15000:RETURN
3499 REM --SET FILTER--
3500 CLS:LOCATE 2,17:PRINT "FILTER"
3510 LOCATE 4,1:FOR X=1 TO 12:PRINT USING "##. ";X;
3520 PRINT LB$(X):NEXT X:PRINT "13. Clear Filter"
3530 PRINT:INPUT "Select: ",Z
3540 IF Z<1 OR Z>12 THEN NF=-1:RETURN
3550 NF=0:FI=Z:FOR X=1 TO 6:LOCATE 5+X,28
3560 PRINT STR$(X);". ";FR$(X):NEXT X
3570 LOCATE 13,29:PRINT "Select: ";
3580 ZS$=INKEY$:IF ZS$="" THEN 3580 ELSE PRINT ZS$
3590 IF ZS$<"1" OR ZS$>"6" THEN NF=-1:RETURN
3600 FZ=VAL(ZS$):LOCATE 20,1
3610 PRINT LB$(FI);SP$;FR$(FZ);SP$;:INPUT "",FS$
3620 IF FS$=CHR$(27) THEN NF=-1:RETURN
3630 NM=0:IF FS$="" THEN FS$=SPACE$(L(FZ))
3640 CLS:GOSUB 4000:IF NOT NM THEN RETURN
3650 LOCATE 12,6:PRINT "No records match the filter."
3660 GOSUB 13500:NF=-1:NM=0:GOTO 3640
3999 REM --FIRST--
4000 D=SN
4010 Z=P(D,1):IF Z<>0 THEN D=Z:GOTO 4010
4020 Z=D:GOSUB 5550:RETURN
4499 REM --INDEX--
4500 CLS:LOCATE 3,18:PRINT "INDEX"
4510 FOR X=1 TO 10:LOCATE 5+X,13:PRINT USING "##. ";X;
4520 PRINT LB$(X):NEXT X:LOCATE 17,13
4530 INPUT "Select: ",Z:IF Z<1 OR Z>10 THEN RETURN
4540 CLS:LOCATE 12,7
4550 PRINT "Indexing; please stand by."
4560 IN=Z:IF IN<6 THEN IV=1 ELSE IV=2
4570 FOR X=1 TO NR:REC=X:GOSUB 12000:ZS$=ML$(IN)
4580 GOSUB 15500:NI$(X,1)=T$:NEXT X
4590 IV=0:GOSUB 2020:RETURN
4999 REM --LAST--
5000 D=SN
5010 Z=P(D,2):IF Z<>0 THEN D=Z:GOTO 5010
5020 Z=D:GOSUB 1560:RETURN
5499 REM --NEXT--
5500 D=DN:NM=0
5510 Z=P(D,2):IF Z=0 THEN Y=D:GOTO 5530
5520 IF P(Z,1)<>0 THEN Z=P(Z,1):GOTO 5520 ELSE 5550
5530 Z=P(Y,3):IF Z=0 THEN NM=-1:SOUND 400,2:REC=DN:GOS
UB 12000:RETURN
5540 IF P(Z,2)=Y THEN Y=Z:GOTO 5530
5550 REC=Z:GOSUB 12000:GOSUB 12500
5560 IF FF THEN DN=Z:RETURN ELSE D=Z:GOTO 5510
```

→

```
5999 REM --PRINT--
6000 CLS:PRINT "Label size:":FOR X=1 TO 3
6010 PRINT HS$(X):NEXT X:FOR X=1 TO 3
6020 ZS$="":LN=LEN(HS$(X)):LOCATE 1+X,LN+1
6030 PRINT STRING$(25-LN,46)
6040 K$=INKEY$
6050 IF (K$<"0" OR K$>"9") AND K$<>R$ THEN 6040
6060 IF K$=R$ THEN 6090
6070 ZS$=ZS$+K$:LOCATE 1+X,26:PRINT ZS$
6080 IF LEN(ZS$)<2 THEN 6040 ELSE 6100
6090 IF LEN(ZS$)=0 THEN ZS$="0":LOCATE 1+X,26:PRINT ZS
$
6100 LOCATE 1+X,LN+1:PRINT SPACE$(25-LN):H(X)=VAL(ZS$)
6110 IF H(X)=0 THEN X=3
6120 NEXT X:IF ZS$="0" THEN RETURN
6130 IF H(2)<21 AND H(3)<5 THEN 6160
6140 LOCATE 10,12:PRINT "Invalid Numbers!"
6150 GOSUB 13500:GOTO 6000
6160 CLS:PRINT TAB(16);"TEMPLATE":PRINT:FOR X=1 TO 12
6170 PRINT USING "##. ";X;:PRINT LB$(X):NEXT X
6180 FOR X=1 TO H(2):LOCATE 2+X,20
6190 PRINT CHR$(X+96):NEXT X:FOR Y=1 TO H(2)
6200 FOR X=1 TO 5:PT$(X,Y)="":NEXT X
6210 X=1:Z=0:T$="":LOCATE 2+Y,21
6220 PRINT CHR$(16);SPACE$(18);:LOCATE 2+Y,22
6230 K$=INKEY$:IF K$<>R$ AND K$<>CHR$(27) AND K$<SP$ T
HEN 6230
6240 IF K$=CHR$(27) THEN Y=H(2):GOTO 6310
6250 IF K$=R$ THEN PT$(X,Y)=T$:X=5:GOTO 6290
6260 Z=Z+1:IF Z>18 THEN X=5:GOTO 6280
6270 PRINT K$;:IF K$<>"+" THEN T$=T$+K$:GOTO 6230
6280 PT$(X,Y)=T$:T$=""
6290 IF VAL(PT$(X,Y))>12 THEN SOUND 400,2:GOTO 6200
6300 X=X+1:IF X<6 THEN 6230
6310 LOCATE 2+Y,21:PRINT SP$;:NEXT Y
6320 IF K$=CHR$(27) THEN RETURN
6330 X=1:GOSUB 16000:CLS:FOR Y=1 TO H(2)
6340 PRINT PS$(1,Y):NEXT Y:PRINT
6350 PRINT "Is this correct?";:GOSUB 9000:CLS
6360 IF ZS$<>"Y" THEN 6160 ELSE LOCATE 5,1
6370 PRINT "Press <Y> to print only the current"
6380 PRINT "record or any other key to print all"
6390 PRINT "the records. ";:GOSUB 9000:PRINT ZS$
6400 CH$=ZS$:LOCATE 11,1
6410 PRINT "Press <Y> to print the template"
6420 PRINT "or any other key to continue. ";
6430 GOSUB 9000:PRINT ZS$:TP$=ZS$:LOCATE 16,1
6440 PRINT "Press <Y> when the printer is ready"
6450 PRINT "or any other key to abort printing. ";
6460 GOSUB 9000:PRINT ZS$:IF ZS$<>"Y" THEN RETURN
6470 IF TP$<>"Y" THEN 6530
6480 FOR Y=1 TO H(2):ZS$="":FOR X=1 TO 5
6490 IF PT$(X,Y)="" THEN 6520
6500 IF X<>1 THEN ZS$=ZS$+"+"
6510 ZS$=ZS$+PT$(X,Y)
6520 NEXT X:LPRINT ZS$:NEXT Y
6530 IF CH$="Y" THEN FOR Y=1 TO H(2):LPRINT PS$(1,Y):N
EXT Y:RETURN
6540 GOSUB 4000
6550 FOR X=1 TO H(3):GOSUB 16000:GOSUB 5500
6560 IF NM THEN X=H(3)
6570 NEXT X:FOR Y=1 TO H(2):FOR X=1 TO H(3)
6580 LPRINT PS$(X,Y);SPACE$(H(1)-LEN(PS$(X,Y)));
6590 PS$(X,Y)="":NEXT X:LPRINT:NEXT Y
6600 IF NM THEN GOSUB 4000:RETURN ELSE 6540
6999 REM --SAVE--
7000 GOSUB 13000:LOCATE 17,1
7010 PRINT "Saving, please stand by."
7020 OPEN F$+".SEQ" FOR OUTPUT AS #1
7030 WRITE#1,SN:WRITE#1,G:WRITE#1,IN:WRITE#1,NR
7040 FOR X=1 TO 1000:WRITE#1,NI$(X,1):WRITE#1,NI$(X,2)
7050 FOR Y=1 TO 3:WRITE#1,P(X,Y):NEXT Y:NEXT X
7060 CLOSE 1:RETURN
7499 REM --SEARCH--
7500 GOSUB 13000:D=SN:LOCATE 17,1
7510 PRINT "What ";LB$(IN);" do you want to"
7520 INPUT "search for? ",ZS$
7530 IF ZS$="" THEN RETURN ELSE GOSUB 15500
7540 IF T$=LEFT$(NI$(D,1),LEN(T$)) THEN DN=D:REC=DN:GO
SUB 12000:RETURN
7550 IF T$<LEFT$(NI$(D,1),LEN(T$)) THEN D=P(D,1) ELSE
D=P(D,2)
7560 IF D<>0 THEN 7540 ELSE GOSUB 13000:LOCATE 17,1
7570 PRINT "Sorry, can't find that ";LB$(IN);"."
7580 GOSUB 13500:RETURN
7999 REM --UNDELETE--
8000 NI$(DN,2)="":RETURN
8499 REM --ERROR ROUTINE--
8500 IF ERR<>63 THEN CLS:LOCATE 6,1
8510 IF MM AND ERR=53 THEN CLOSE 1:RESUME 320
8520 PRINT "You have error number";ERR;"in line";STR$(
ERL);"."
8530 IF ERR<>61 THEN 8570
8540 PRINT "The disk is full.  You must exit"
8550 PRINT "and copy this list to a new disk."
8560 CLOSE:GOSUB 13500:RESUME 140
8570 IF ERR<>25 THEN 8600
8580 PRINT "The printer is not ready.":GOSUB 13500
8590 REC=DN:GOSUB 12000:RESUME 460
8600 PRINT "Please check your BASIC manual for"
8610 PRINT "further explanation."
8620 GOSUB 13500:RESUME 140
8999 REM --INKEY--
9000 ZS$=INKEY$:IF ZS$="" THEN 9000
9010 Z=ASC(ZS$):ZS$=CHR$(Z-32*(Z>96)*(Z<123)):RETURN
9499 REM --CATALOG--
9500 CLS:LOCATE 6,1
9510 INPUT "What drive are the files in ";DR$
9520 IF DR$="" THEN CLS:FILES:PRINT:GOSUB 13500:RETURN
9530 IF RIGHT$(DR$,1)<>":" THEN DR$=LEFT$(DR$,1)+":"
9540 CLS:FILES DR$:PRINT:GOSUB 13500:RETURN
9999 REM --OPEN RANDOM FILE--
10000 OPEN "R",#2,F$+".RAF"
10010 FIELD #2,L(1) AS RF$(1),L(2) AS RF$(2),L(3) AS R
F$(3),L(4) AS RF$(4),L(5) AS RF$(5)
10020 OPEN "R",#3,F$+".RAF"
10030 FIELD #3,L(6) AS RF$(6),L(7) AS RF$(7),L(8) AS R
F$(8),L(9) AS RF$(9),L(10) AS RF$(10),L(11) AS RF$(11)
,L(12) AS RF$(12)
10040 RETURN
10499 REM --CLS--
10500 CLS:LOCATE 25,1:COLOR 2:PRINT "List: ";F$;
10510 LOCATE 25,16:PRINT "Index: ";LB$(IN)
10520 IF NF THEN 10540 ELSE LOCATE 24,1:COLOR 10
10530 PRINT "Filter: ";LB$(FI);SP$;FR$(FZ);SP$;FS$;
10540 COLOR 7:RETURN
10999 REM --INPUT RECORD--
11000 LOCATE 18,1
11010 PRINT "Leave the Last Name line blank when"
11020 PRINT "you have no more names to add."
11030 IF G<>0 THEN 11080 ELSE CLS:LOCATE 6,1
11040 PRINT "You have reached the limit for this"
11050 PRINT "list.  If you have more names to add,"
11060 PRINT "start a new list.":GOSUB 13500
11070 GOSUB 7000:RETURN
11080 FOR X=1 TO 12:ML$(X)=STRING$(L(X),32):NEXT X
11090 GOSUB 11500:GOSUB 14000
11100 IF ML$(1)=STRING$(20,32) THEN RETURN
11110 DN=G:G=P(DN,1):NI$(DN,2)="":IF NR<DN THEN NR=DN
11120 GOSUB 14500:REC=DN:GOSUB 15000:GOTO 11030
11499 REM --DISPLAY RECORD--
11500 FOR X=1 TO 12:LOCATE RO(X),1
11510 COLOR 2:PRINT LB$(X);": ";:COLOR 7
11520 PRINT ML$(X);CHR$(17):NEXT X
11530 IF NI$(DN,2)<>"*" THEN RETURN
11540 LOCATE 2,1:COLOR 10
11550 PRINT "Marked for Deletion.":COLOR 7:RETURN
11999 REM --READ RECORD--
12000 IF IV<>2 THEN GET #2,2*REC-1:FOR Y=1 TO 5:ML$(Y)
=RF$(Y):NEXT Y
12010 IF IV<>1 THEN GET #3,2*REC:FOR Y=6 TO 12:ML$(Y)=
RF$(Y):NEXT Y
```

```
12020 RETURN
12499 REM --MATCH FILTER--
12500 IF NF THEN FF=-1:RETURN
12510 ZS$=LEFT$(ML$(FI),LEN(FS$))
12520 IF (ZS$<FS$ AND (FZ>1 AND FZ<5)) OR (ZS$=FS$ AND
 (FZ=1 OR FZ=4 OR FZ=6)) OR (ZS$>FS$ AND (FZ=2 OR FZ=5
 OR FZ=6)) THEN FF=-1 ELSE FF=0
12530 RETURN
12999 REM --CLEAR COMMAND LINE--
13000 FOR X=16 TO 20:LOCATE X,1:PRINT BL$:NEXT X:RETUR
N
13499 REM --PRESS ANY KEY--
13500 PRINT:PRINT TAB(7);"Press any key to continue."
13510 GOSUB 9000:RETURN
13999 REM --EDITOR--
14000 CY=1:MF=0:LOCATE 21,1:PRINT "MODE: ";MD$(0);
14010 T$=ML$(CY):CX=1
14020 LOCATE RO(CY),CO(CY)+CX:PRINT CHR$(219)
14030 LOCATE RO(CY),CO(CY)+CX:PRINT MID$(T$,CX,1)
14040 K$=INKEY$:IF K$="" THEN 14020
14050 IF LEN(K$)=1 THEN 14140
14060 DK=INSTR("KMHPR",RIGHT$(K$,1))
14070 IF DK=0 THEN SOUND 400,2:GOTO 14020
14080 ON DK GOTO 14090,14090,14100,14100,14120
14090 DX=(DK=1)-(DK=2):IF (CX=1 AND DX=-1) OR (CX=L(CY
) AND DX=1) THEN SOUND 400,2:GOTO 14020 ELSE CX=CX+DX:
GOTO 14020
14100 ML$(CY)=T$:CY=CY+(DK=3)-(DK=4)
14110 CY=(CY+11) MOD 12+1:GOTO 14010
14120 MF=NOT MF:LOCATE 21,7
14130 PRINT MD$(ABS(MF)):GOTO 14020
14140 IF K$=R$ THEN ML$(CY)=T$:RETURN
14150 IF K$<>CHR$(8) THEN 14190
14160 IF CX=1 THEN SOUND 400,4:GOTO 14020
14170 T$=LEFT$(T$,CX-2)+MID$(T$,CX)+SP$
14180 CX=CX-1:GOTO 14230
14190 IF K$<SP$ THEN SOUND 400,2:GOTO 14020
14200 IF MF THEN MID$(T$,CX,1)=K$:GOTO 14220
14210 T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX,L(CY)-CX)
14220 CX=CX-(CX<>L(CY))
14230 LOCATE RO(CY),CO(CY)+1:PRINT T$:GOTO 14020
14499 REM --SET POINTERS--
14500 ZS$=ML$(IN):GOSUB 15500:NI$(DN,1)=T$
14510 P(DN,1)=0:P(DN,2)=0:P(DN,3)=0
14520 IF NR=1 THEN RETURN ELSE X=1
14530 IF NI$(DN,1)<NI$(X,1) THEN 14560
14540 Z=P(X,2):IF Z=0 THEN P(X,2)=DN:P(DN,3)=X:RETURN
14550 X=Z:GOTO 14530
14560 Z=P(X,1):IF Z=0 THEN P(X,1)=DN:P(DN,3)=X:RETURN
14570 X=Z:GOTO 14530
14999 REM --WRITE RECORD--
15000 FOR Y=1 TO 5:LSET RF$(Y)=ML$(Y):NEXT Y
15010 PUT #2,2*REC-1:FOR Y=6 TO 12
15020 LSET RF$(Y)=ML$(Y):NEXT Y:PUT #3,2*REC:RETURN
15499 REM --CONVERT TO CAPS--
15500 T$="":FOR Y=1 TO LEN(ZS$):Z=ASC(MID$(ZS$,Y,1))
15510 T$=T$+CHR$(Z-32*(Z>96)*(Z<123)):NEXT Y:RETURN
15999 REM --ASSEMBLE LABEL--
16000 FOR Z=1 TO H(2):PS$(X,Z)="":FOR V=1 TO 5
16010 IF VAL(PT$(V,Z))=0 THEN PS$(X,Z)=PS$(X,Z)+PT$(V,
Z):GOTO 16060
16020 ZS$=ML$(VAL(PT$(V,Z)))
16030 FOR Y=LEN(ZS$) TO 1 STEP -1
16040 IF MID$(ZS$,Y,1)<>SP$ THEN PS$(X,Z)=PS$(X,Z)+LEF
T$(ZS$,Y):Y=1
16050 NEXT Y
16060 NEXT V:IF LEN(PS$(X,Z))>H(1) THEN PS$(X,Z)=LEFT$
(PS$(X,Z),H(1))
16070 NEXT Z:RETURN
16500 DATA 20,15,30,30,30,15,2,10,15,15,30,30
17000 DATA Last Name,First Name,Company,Add. #1
17010 DATA Add. #2,City,State,Zip Code,Phone #1
17020 DATA Phone #2,Note #1,Note #2
17500 DATA "   Characters across"
17510 DATA "   Lines down",Labels across
18000 DATA =,<>,<,<=,>,>=
```

CIRCLE READER SERVICE 26



CIRCLE READER SERVICE 19

WRECKLESS RACER

BY JOEY LATIMER

Auto racing is a risky business. One minute you have the finish line in sight, and the next you're kissing a fence. With the high cost of auto insurance, that can be *very* expensive . . . not to mention what it can do to your face!

If you'd like to do a little racing of your own—minus the broken bones, of course—try *Wreckless Racer*. Just type in the program in BASIC, SAVE it, and then RUN it. Follow the simple instructions displayed on the screen, and you'll be off and racing!

Use the keyboard as your steering wheel and cruise around the oval race track five times. If you manage to complete five laps and cross the finish line, your time will be posted and compared to the fastest time. Be sure to watch out for the walls, holes, and oil slicks on the track, or you will end up disqualified!

OK, programmers, start your engines!

Apple II series/*Wreckless Racer*

```
10 DIM A(29),B(29),C(29),NC(4),NR(4)
20 G$ = CHR$(7):FOR X = 1 TO 4:READ NC(X),NR(X):NEXT X
30 FT = 999:FOR X = 1 TO 29:READ A(X),B(X),C(X):NEXT X
40 Z = -16336:HOME:GOSUB 1000:VTAB 5:HTAB 1
50 PRINT "SET THE SPEED FACTOR BY ENTERING ANY"
60 PRINT "NUMBER BETWEEN 1 (FASTEST) AND 7"
70 PRINT "(SLOWEST).":PRINT
80 GOSUB 2000:SP = VAL(K$)-1
90 IF SP < 0 OR SP > 6 THEN PRINT G$:GOTO 80
100 PRINT "DRIVE FIVE LAPS AROUND THE RACE TRACK"
110 PRINT "AND TRY TO BEAT THE FASTEST TIME.":PRINT
120 PRINT " THESE KEYS CONTROL THE CAR'S MOVEMENT:"
130 PRINT:GOSUB 3000:PRINT:PRINT
140 PRINT "PRESS <RETURN> TO START,"
150 PRINT TAB(7);"<C> TO CHANGE SPEED FACTOR, OR"
160 PRINT TAB(7);"<Q> TO QUIT.";
170 GOSUB 2000:IF K$ = "C" THEN 40
180 IF K$ = "Q" THEN HOME:END
190 IF K$ <> CHR$(13) THEN PRINT G$:GOTO 170
200 HOME:L = 0:INVERSE:FOR X = 1 TO 19:VTAB X:HTAB 2
210 PRINT SPC(38):NEXT X:NORMAL:FOR X = 1 TO 29
220 VTAB A(X):HTAB B(X):PRINT SPC(C(X)):NEXT X
230 VTAB INT(RND(1)*2)+4:HTAB INT(RND(1)*20)+13
240 PRINT "x":VTAB 6:HTAB INT(RND(1)*8)+6:PRINT "X"
250 VTAB INT(RND(1)*8)+6:HTAB INT(RND(1)*3)+35
260 PRINT "X":VTAB INT(RND(1)*11)+6
270 HTAB INT(RND(1)*3)+4:PRINT "X"
280 VTAB INT(RND(1)*4)+15:HTAB INT(RND(1)*3)+10
290 PRINT "OIL":FLASH:VTAB 16:HTAB 18:PRINT "*":NORMAL
300 FOR Y = 15 TO 18
310 VTAB Y:HTAB 19:PRINT CHR$(124):NEXT Y
320 VTAB 20:HTAB 2:PRINT "LAP: 0";SPC(4);"TIME: 0";SPC
(4);"FAST TIME: ";INT(FT):GOSUB 3000
330 VTAB 10:HTAB 12:GOSUB 1010:POKE -16368,0
340 VTAB 12:HTAB 13:PRINT "PRESS <L> TO START!";
350 GOSUB 2000:IF K$ <> "L" THEN PRINT G$:GOTO 350
360 VTAB 12:HTAB 13:INVERSE:PRINT SPC(19):NORMAL
370 DX = 1:DY = 0:DK = 4:TX = 18:TY = 16
380 HX = TX:HY = TY:FI = 0
390 VTAB HY:HTAB HX:PRINT CHR$(32)
400 TX = TX+DX:TY = TY+DY
410 CH = SCRN(TX-1,2*(TY-1))+16*SCRN(TX-1,2*(TY-1)+1)-
128:IF CH = 32 THEN 460
420 IF CH <> 124 THEN 560
430 IF DK <> 4 THEN 560
440 F = 1:L = L+1:VTAB 20:HTAB 7:PRINT L
450 IF L = 6 THEN 610
460 VTAB TY:HTAB TX:PRINT "*":HX = TX:HY = TY
470 FI = FI+0.1:VTAB 20:HTAB 18:PRINT INT(FI)
480 FOR DE = 0 TO 15*SP:NEXT DE
490 K = PEEK(-16384)-128:IF K < 0 THEN 540
500 POKE -16368,0:K = K-32*(K > 96)*(K < 123)
510 IF K < 73 OR K > 76 THEN 540
520 DK = K-72:DX = NC(DK):DY = NR(DK)
530 IF F AND DK <> 4 THEN 560
540 IF NOT F THEN 390
550 F = 0:VTAB HY:HTAB HX:PRINT CHR$(124):GOTO 400
560 FOR X = 1 TO 30
570 VTAB TY:HTAB TX:PRINT CHR$(INT(RND(1)*4)+41)
580 BZ = PEEK(Z)+PEEK(Z):NEXT X:GOSUB 1000
590 VTAB 4:PRINT "SORRY!  YOU RAN INTO SOMETHING!"
600 PRINT "YOU HAVE BEEN DISQUALIFIED.":PRINT:GOTO 670
610 FOR T = 1 TO 100:BZ = PEEK(Z)+PEEK(Z):NEXT T
620 HOME:PRINT
630 PRINT "CONGRATULATIONS!  YOU MADE IT!":PRINT
640 PRINT:PRINT "YOUR TIME WAS ";INT(FI);"."
650 IF FI < FT THEN FT = FI
660 PRINT "THE FASTEST TIME IS ";INT(FT);".":PRINT
670 PRINT "PRESS <RETURN> TO START AGAIN,":GOTO 150
1000 HOME:VTAB 2:HTAB 9
1010 PRINT "*--WRECKLESS RACER--*":RETURN
2000 K = PEEK(-16384)-128:IF K < 0 THEN 2000
2010 POKE -16368,0
2020 K$ = CHR$(K-32*(K > 96)*(K < 123)):RETURN
3000 PRINT TAB(3);"<J>=LEFT <L>=RIGHT <I>=UP <K>=DOWN"
3010 PRINT
3020 PRINT " DRIVE SAFELY.  RUNNING INTO OIL SLICKS,";
3030 PRINT " HOLES, OR WALLS WILL DISQUALIFY YOU!";
3040 RETURN
4000 DATA 0,-1,-1,0,0,1,1,0
5000 DATA 2,4,14,2,27,10,3,3,16,3,26,12,4,3,36,5,3,36
5010 DATA 6,3,36,7,3,6,7,18,10,7,35,4,8,3,5,8,19,7
5020 DATA 8,35,4,9,3,5,9,35,4,10,3,5,10,35,4,11,3,5
5030 DATA 11,35,4,12,3,5,12,35,4,13,3,6,13,35,4,14,3,8
5040 DATA 14,34,5,15,3,36,16,3,35,17,4,33,18,5,31
```

Commodore 64 & 128 (C 64 mode)/*Wreckless Racer*

```
10 DIM A(29),B(29),C(29),NC(4),NR(4):PRINT CHR$(154)
20 DN=51164:MV=49700:OV=51163:SB=1024:S=54272
30 D$=CHR$(122):FOR X=1 TO 38:TR$=TR$+CHR$(32)
40 SP$=SP$+CHR$(166):NEXT X
50 FOR X=S TO S+23:POKE X,0:NEXT X:POKE S+24,15
60 POKE S+5,66:POKE S+6,66:POKE 53281,14:POKE 53280,14
70 POKE 646,1:FOR X=1 TO 4:READ NC(X),NR(X):NEXT X
80 FT=999:FOR X=1 TO 29:READ A(X),B(X),C(X):NEXT X
90 FOR X=49700 TO 49710:READ ML:POKE X,ML:NEXT X
100 GOSUB 1000:POKE DN,5:POKE OV,0:SYS MV
110 PRINT "SET THE SPEED FACTOR BY ENTERING A"
120 PRINT "NUMBER BETWEEN 1 (FASTEST) AND 7"
130 PRINT "(SLOWEST).":PRINT
140 GOSUB 2000:SP=VAL(K$)-1:IF SP<0 OR SP>6 THEN 140
170 PRINT "DRIVE FIVE LAPS AROUND THE RACE TRACK"
180 PRINT "AND TRY TO BEAT THE FASTEST TIME.":PRINT
190 PRINT " THESE KEYS CONTROL THE CAR'S MOVEMENT:"
200 PRINT:GOSUB 3000:PRINT:PRINT
210 PRINT "PRESS <RETURN> TO START,"
```

```
220 PRINT TAB(6);"<C> TO CHANGE SPEED FACTOR, OR"
230 PRINT TAB(6);"<Q> TO QUIT."
240 POKE S+4,32:GOSUB 2000:IF K$="C" THEN 100
250 IF K$<>"Q" THEN 270
260 PRINT CHR$(147);CHR$(154):POKE 53280,6
265 POKE 53281,6:POKE 646,14:END
270 IF K$<>CHR$(13) THEN 240
290 PRINT CHR$(147);CHR$(144);:L=0
300 FOR X=1 TO 19:PRINT TAB(1);SP$:NEXT X
310 FOR X=1 TO 29:POKE DN,A(X):POKE OV,B(X):SYS MV
320 PRINT LEFT$(TR$,C(X)):NEXT X
330 POKE DN,INT(RND(1)*2)+4:POKE OV,INT(RND(1)*20)+13
340 SYS MV:PRINT CHR$(158);D$
350 POKE DN,5:POKE OV,INT(RND(1)*8)+5:SYS MV:PRINT D$
360 POKE DN,INT(RND(1)*8)+5:POKE OV,INT(RND(1)*3)+34
370 SYS MV:PRINT D$:POKE DN,INT(RND(1)*11)+5
380 POKE OV,INT(RND(1)*3)+3:SYS MV:PRINT D$
390 POKE DN,INT(RND(1)*4)+14:POKE OV,INT(RND(1)*3)+9
400 SYS MV:PRINT CHR$(159);"OIL"
410 POKE DN,15:POKE OV,18:SYS MV:PRINT CHR$(5);"*"
420 FOR Y=14 TO 17:POKE DN,Y:POKE OV,19:SYS MV
430 PRINT CHR$(221):NEXT Y:POKE DN,19:POKE OV,2
440 SYS MV:PRINT CHR$(5);"LAP: 0";SPC(4);"TIME: 0";SPC
(4);"FAST TIME:";FT
470 GOSUB 3000:POKE DN,9:POKE OV,10:SYS MV:GOSUB 1010
480 GET K$:IF K$<>"" THEN 480
490 POKE DN,11:POKE OV,11:SYS MV
500 PRINT "PRESS <L> TO START!"
510 GOSUB 2000:IF K$<>"L" THEN 510
530 POKE DN,11:POKE OV,11:SYS MV
540 PRINT CHR$(144);LEFT$(SP$,19);CHR$(5)
550 DX=1:DY=0:DK=4:TX=18:TY=15:HX=TX:HY=TY:SL=TI
560 POKE DN,HY:POKE OV,HX:SYS MV:PRINT CHR$(32);
570 TX=TX+DX:TY=TY+DY
580 CH=PEEK(SB+TX+40*TY):IF CH=32 THEN 630
590 IF CH<>93 THEN 740
600 IF DK<>4 THEN 740
610 F=-1:L=L+1:POKE DN,19:POKE OV,6:SYS MV
620 PRINT L:IF L=6 THEN 830
630 POKE DN,TY:POKE OV,TX:SYS MV:PRINT "*";
640 HX=TX:HY=TY:FI=INT((TI-SL)/50)
650 POKE DN,19:POKE OV,17:SYS MV:PRINT FI;
660 FOR DE=0 TO 20*SP:NEXT DE
670 GET K$:IF K$="" THEN 710
680 K=ASC(K$):IF K<73 OR K>76 THEN 700
690 DK=K-72:DX=NC(DK):DY=NR(DK)
700 IF F AND DK<>4 THEN 740
710 IF NOT F THEN 560
720 F=0:POKE DN,HY:POKE OV,HX:SYS MV
730 PRINT CHR$(221):GOTO 570
740 POKE S+4,33:FOR X=1 TO 30:POKE DN,TY
760 POKE OV,TX:SYS MV:PRINT CHR$(INT(RND(1)*4)+42)
770 POKE S+1,INT(RND(1)*100)+10:POKE S,14
780 NEXT X:POKE S+4,32:POKE S+1,0:GOSUB 1000
790 POKE DN,4:POKE OV,0:SYS MV
800 PRINT CHR$(5);"SORRY!  YOU RAN INTO SOMETHING!"
810 PRINT "YOU HAVE BEEN DISQUALIFIED."
820 PRINT:GOTO 910
830 POKE S+4,33:FOR X=20 TO 140:POKE S+1,X:POKE S,14
840 POKE 53280,X/10:NEXT X:POKE S+4,32:POKE S+1,0
850 PRINT CHR$(147);CHR$(5)
860 PRINT "CONGRATULATIONS!  YOU MADE IT!":PRINT
870 PRINT:PRINT "YOUR TIME WAS";STR$(FI);"."
880 IF FI<FT THEN FT=FI
890 PRINT "THE FASTEST TIME IS";STR$(FT);".":PRINT
910 PRINT "PRESS <RETURN> TO START AGAIN,":GOTO 220
1000 PRINT CHR$(147):POKE DN,2:POKE OV,10:SYS MV
1010 PRINT "*--WRECKLESS RACER--*":RETURN
2000 GET K$:IF K$="" THEN 2000
2010 K=ASC(K$):K$=CHR$(K-(K>96)*(K<123)*32):RETURN
3000 PRINT "  <J>=LEFT <L>=RIGHT <I>=UP <K>=DOWN"
3010 PRINT
3020 PRINT " DRIVE SAFELY. RUNNING INTO OIL SLICKS,"
3030 PRINT " HOLES, OR WALLS WILL DISQUALIFY YOU!";
3040 RETURN
4000 DATA 0,-1,-1,0,0,1,1,0
```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```
4010 DATA 1,3,14,1,26,10,2,2,16,2,25,12,3,2,36,4,2,36
4020 DATA 5,2,36,6,2,6,6,17,10,6,34,4,7,2,5,7,18,7
4030 DATA 7,34,4,8,2,5,8,34,4,9,2,5,9,34,4,10,2,5
4040 DATA 10,34,4,11,2,5,11,34,4,12,2,6,12,34,4,13,2,8
4050 DATA 13,33,5,14,2,36,15,2,35,16,3,33,17,4,31
4060 DATA 174,220,199,172,219,199,24,32,240,255,96
```

IBM PC & compatibles/*Wreckless Racer*

```
10 DEF SEG=&H40
20 IF (PEEK(&H10) AND 48)=32 THEN WIDTH 40
30 DEF SEG:DIM A(29),B(29),C(29),NC(4),NR(4)
40 KEY OFF:COLOR ,0:SCREEN 0,0:RANDOMIZE TIMER
50 FOR X=1 TO 4:READ NC(X),NR(X):NEXT X
60 FT=999:FOR X=1 TO 29:READ A(X),B(X),C(X):NEXT X
70 GOSUB 1000:COLOR 2:LOCATE 5,1
80 PRINT "Set the speed factor by entering a"
90 PRINT "number between 1 (fastest) and 7"
100 PRINT "(slowest)."
110 GOSUB 2000:SP=VAL(K$)-1
120 IF SP<0 OR SP>6 THEN BEEP:GOTO 110
130 COLOR 7:PRINT:PRINT
140 PRINT "Drive five laps around the race track"
150 PRINT "and try to beat the fastest time.":PRINT
160 COLOR 3:PRINT " These keys control the car's movem
ent:"
170 PRINT:GOSUB 3000:PRINT:PRINT
180 COLOR 7:PRINT "Press <ENTER> to start,"
190 PRINT TAB(7);"<C> to change speed factor, or"
200 PRINT TAB(7);"<Q> to quit."
210 GOSUB 2000:IF K$="C" THEN 70
220 IF K$="Q" THEN COLOR 7:CLS:KEY ON:END
230 IF K$<>CHR$(13) THEN BEEP:GOTO 210
240 CLS:COLOR 2:L=0
250 FOR X=1 TO 19:PRINT TAB(2);STRING$(38,178):NEXT X
260 FOR X=1 TO 29:LOCATE A(X),B(X):PRINT SPACE$(C(X))
270 NEXT X:COLOR 4
280 LOCATE INT(RND*2)+4,INT(RND*20)+13:PRINT CHR$(4)
290 LOCATE 6,INT(RND*8)+6:PRINT CHR$(4)
300 LOCATE INT(RND*8)+6,INT(RND*3)+35:PRINT CHR$(4)
310 LOCATE INT(RND*11)+6,INT(RND*3)+4:PRINT CHR$(4)
320 COLOR 12:LOCATE INT(RND*4)+15,INT(RND*3)+10
330 PRINT "OIL":COLOR 31:LOCATE 16,18:PRINT "*"
340 COLOR 15:FOR Y=15 TO 18
350 LOCATE Y,19:PRINT CHR$(179):NEXT Y
360 COLOR 13:LOCATE 20,3:PRINT "Lap: 0"
370 COLOR 12:LOCATE 20,13:PRINT "Time: 0"
380 COLOR 14:LOCATE 20,25:PRINT "Fast Time:";
390 COLOR 15:PRINT FT:GOSUB 3000
400 LOCATE 10,11:GOSUB 1010:COLOR 30
410 K$=INKEY$:IF K$<>"" THEN 410
420 LOCATE 12,12:PRINT "Press <L> to start!":COLOR 2
430 GOSUB 2000:IF K$<>"L" THEN BEEP:GOTO 430
440 LOCATE 12,12:PRINT STRING$(19,178):COLOR 15
450 DX=1:DY=0:DK=4:TX=18:TY=16:HX=TX:HY=TY:ST=TIMER
460 LOCATE HY,HX:PRINT CHR$(32)
470 TX=TX+DX:TY=TY+DY
480 CH=SCREEN(TY,TX):IF CH=32 THEN 520
490 IF CH<>179 THEN 620
500 IF DK<>4 THEN 620
510 F=-1:L=L+1:LOCATE 20,7:PRINT L:IF L=6 THEN 670
520 LOCATE TY,TX:PRINT "*":HX=TX:HY=TY
530 FI=INT(TIMER-ST):IF FI<0 THEN FI=FI+86400!
540 LOCATE 20,18:PRINT FI
550 FOR DE=0 TO 50*SP:NEXT DE
560 K$=INKEY$:IF K$="" THEN 600
570 GOSUB 2010:DK=INSTR("IJKL",K$)
580 IF DK<>0 THEN DX=NC(DK):DY=NR(DK)
590 IF F AND DK<>4 THEN 620
600 IF NOT F THEN 460
610 F=0:LOCATE HY,HX:PRINT CHR$(179):GOTO 470
620 FOR X=1 TO 30:COLOR INT(RND*15)+1
630 LOCATE TY,TX:PRINT "*":SOUND INT(RND*100)+100,.5
640 NEXT X:COLOR 2:GOSUB 1000:COLOR 14
650 LOCATE 4,1:PRINT "Sorry!  You ran into something!"
660 PRINT "You have been disqualified.":PRINT:GOTO 720
670 PLAY "L16MBO1CDEFGAGFEDC":CLS:COLOR 14:PRINT
680 PRINT "Congratulations!  You made it!":PRINT
690 COLOR 12:PRINT:PRINT "Your time was";STR$(FI);"."
700 COLOR 11:IF FI<FT THEN FT=FI
710 PRINT "The fastest time is";STR$(FT);".":PRINT
720 COLOR 2
730 PRINT "Press <ENTER> to start again,":GOTO 190
1000 CLS:LOCATE 2,10,0
1010 COLOR 13:PRINT "*--Wreckless Racer--*":RETURN
2000 K$=INKEY$:IF K$="" THEN 2000
2010 K=ASC(K$):K$=CHR$(K-(K>96)*(K<123)*32):RETURN
3000 COLOR 2:PRINT TAB(3);"<J>=left <L>=right <I>=up <
K>=down":COLOR 3:PRINT
3010 PRINT " Drive safely.  Running into oil slicks,";
3020 PRINT " holes, or walls will disqualify you!";:RE
TURN
4000 DATA 0,-1,-1,0,0,1,1,0
5000 DATA 2,4,14,2,27,10,3,3,16,3,26,12,4,3,36,5,3,36
5010 DATA 6,3,36,7,3,6,7,18,10,7,35,4,8,3,5,8,19,7
5020 DATA 8,35,4,9,3,5,9,35,4,10,3,5,10,35,4,11,3,5
5030 DATA 11,35,4,12,3,5,12,35,4,13,3,6,13,35,4,14,3,8
5040 DATA 14,34,5,15,3,36,16,3,35,17,4,33,18,5,31
```

Macintosh/*Wreckless Racer*

```
10 DIM A(29),B(29),C(29),BD(19,38),NC(4),NR(4)
20 RANDOMIZE TIMER:CALL TEXTFONT(4):CALL TEXTSIZE (9)
30 CALL TEXTMODE(0):CALL HIDECURSOR:WIDTH 85
40 WINDOW 1,"*--Wreckless Racer--*",(0,38)-(527,338)
50 BK$=CHR$(250):FOR X=0 TO 4:READ NC(X),NR(X):NEXT X
60 FT=999:FOR X=1 TO 29:READ A(X),B(X),C(X):NEXT X
70 FOR X=1 TO 38:FOR Y=1 TO 19:BD(Y,X)=-1:NEXT Y,X
80 CLS:LOCATE 5,1
90 PRINT TAB(24);"Set the speed factor by entering a"
100 PRINT TAB(24);"number between 1 (fastest) and 7"
110 PRINT TAB(24);"(slowest).":PRINT
120 GOSUB 1000:SP=VAL(K$)-1
130 IF SP<0 OR SP>6 THEN BEEP:GOTO 120
140 PRINT TAB(24);"These keys control the car's moveme
nt:":GOSUB 2000:PRINT:PRINT
150 PRINT:PRINT TAB(24);"Press <RETURN> to start,"
160 PRINT TAB(31);"<C> to change speed factor, or"
170 PRINT TAB(31);"<Q> to quit."
180 GOSUB 1000:IF K$="C" THEN CLS:GOTO 80
190 IF K$="Q" THEN CLS:END
200 IF K$<>CHR$(13) THEN BEEP:GOTO 180 ELSE CLS
210 L=0:FOR X=1 TO 19:PRINT TAB(24);STRING$(40,250)
220 NEXT X:CALL TEXTMODE(2):FOR X=1 TO 29
230 LOCATE A(X),B(X)+23:PRINT STRING$(C(X),250)
240 LOCATE A(X),B(X)+23:PRINT SPACE$(C(X))
250 FOR Y=B(X) TO B(X)+C(X)-1:BD(A(X),Y)=32:NEXT Y,X
260 D=INT(RND*2)+4:E=INT(RND*20)+36:LOCATE D,E
270 PRINT CHR$(215):BD(D,E-23)=-1:E=INT(RND*8)+29
280 LOCATE 6,E:PRINT CHR$(215):BD(6,E-23)=-1
290 D=INT(RND*8)+6:E=INT(RND*3)+58:LOCATE D,E
300 PRINT CHR$(215):BD(D,E-23)=-1
310 D=INT(RND*11)+6:E=INT(RND*3)+27:LOCATE D,E
320 PRINT CHR$(215):BD(D,E-23)=-1
330 D=INT(RND*4)+15:E=INT(RND*3)+10:LOCATE D,E+23
340 PRINT "OIL":FOR X=E TO E+2:BD(D,X)=-1:NEXT X
350 LOCATE 16,41:PRINT "*":FOR Y=15 TO 18:BD(Y,19)=124
360 LOCATE Y,42:PRINT CHR$(124):NEXT Y:LOCATE 20,25
370 PRINT "Lap: 0";SPC(6);"Time: 0";SPC(6);"Fast Time:
";FT:GOSUB 2000
380 K$=INKEY$:IF K$<>"" THEN 380
390 LOCATE 12,35:PRINT STRING$(19,250)
400 LOCATE 12,35:PRINT "Press <L> to start!"
410 GOSUB 1000:IF K$<>"L" THEN BEEP:GOTO 410
420 LOCATE 12,35:PRINT "Press <L> to start!"
430 LOCATE 12,35:PRINT STRING$(19,250)
440 DX=1:DY=0:DK=4:FI=0:TX=18:TY=16
450 HX=TX:HY=TY:START=TIMER:FI=0
460 LOCATE HY,HX+23:PRINT "*"
470 TX=TX+DX:TY=TY+DY
480 CH=BD(TY,TX):IF CH=32 THEN 530
```

```
490 IF CH<>124 THEN 640
500 IF DK<>4 THEN 640
510 F=-1:LOCATE 20,29:PRINT L:L=L+1
520 LOCATE 20,29:PRINT L:IF L=6 THEN 700
530 LOCATE TY,TX+23:PRINT "*":HX=TX:HY=TY
540 LOCATE 20,42:PRINT FI
550 FI=TIMER-START:IF FI<0 THEN FI=FI+86400!
560 LOCATE 20,42:PRINT FI:FOR DE=0 TO 50*SP:NEXT DE
570 K$=INKEY$:IF K$="" THEN 610
580 GOSUB 1010:DK=INSTR("IJKL",K$)
590 IF DK<>0 THEN DX=NC(DK):DY=NR(DK)
600 IF F AND DK<>4 THEN 640
610 IF NOT F THEN 460
620 F=0:CALL TEXTMODE(0):LOCATE HY,HX+23
630 PRINT CHR$(124):CALL TEXTMODE(2):GOTO 470
640 FOR X=1 TO 30
650 LOCATE TY,TX+23:PRINT CHR$(INT(RND*4)+42)
660 SOUND INT(RND*100)+100,.5:NEXT X:CLS:LOCATE 4,24
670 PRINT "Sorry!  You ran into something!"
680 PRINT TAB(24);"You have been disqualified."
690 PRINT:GOTO 780
700 CLS:PRINT:FOR X=100 TO 550 STEP 10
710 SOUND X,.5:NEXT X
720 PRINT TAB(24);"Congratulations!  You made it!"
730 PRINT:PRINT
740 PRINT TAB(24);"Your time was";STR$(FI);"."
750 IF FI<FT THEN FT=FI
760 PRINT TAB(24);"The fastest time is";STR$(FT);"."
770 PRINT
780 PRINT TAB(24);"Press <RETURN> to start again,"
790 GOTO 160
1000 K$=INKEY$:IF K$="" THEN 1000
1010 K=ASC(K$):K$=CHR$(K-(K>96)*(K<123)*32):RETURN
2000 PRINT:PRINT TAB(26);"<J>=left <L>=right <I>=up <K
>=down"
2010 PRINT:PRINT TAB(24);"Drive safely.  Running into
oil slicks,";"
2020 PRINT TAB(24);"holes, or walls will disqualify yo
u!":RETURN
3000 DATA 0,0,0,-1,-1,0,0,1,1,0
4000 DATA 2,4,14,2,27,10,3,3,16,3,26,12,4,3,36,5,3,36
4010 DATA 6,3,36,7,3,6,7,18,10,7,35,4,8,3,5,8,19,7
4020 DATA 8,35,4,9,3,5,9,35,4,10,3,5,10,35,4,11,3,5
4030 DATA 11,35,4,12,3,5,12,35,4,13,3,6,13,35,4,14,3,8
4040 DATA 14,34,5,15,3,36,16,3,35,17,4,33,18,5,31
```

THE SYSTEMS WE TEST ON

Every FAMILY & HOME-OFFICE COMPUTING program is thoroughly tested before publication. The exact systems we use during the testing process are listed here. Although you can be sure that a program will work if your system matches ours, a comparable system configuration should also work. For example, even though we do not test on the Franklin Ace, Apple programs should work on this system. Any exception to the following hardware and software configurations will be listed in the chart on page 71. Systems that do not have specific printers listed were tested with Epson FX-80 printers when printer options were available.

Apple IIe in 40-column mode w/64K RAM, DOS 3.3, two disk drives, MPC parallel-printer interface, monochrome and color monitors. Apple programs should also work on Apple II/c/Plus/GS and under ProDOS. **Commodore 128** in C 64 mode with two 1571 disk drives, color monitor, and Micrografix parallel graphics interface. Programs should also work on Commodore 64/64C/128D. **IBM PC** w/640K RAM, Disk BASIC D2.00, IBM Monochrome Display and Printer Adapter, monochrome monitor, IBM Color/Graphics Monitor Adapter, RGB monitor, AST Sixpack Plus, and IBM PC DOS 3.10. Should also work on IBM PCjr and IBM PS/2 Models 25 and 30. **Macintosh** w/512K RAM, two disk drives, Microsoft BASIC 2.1, and ImageWriter printer. Macintosh programs should also work on 128K Mac/Mac Plus/SE/II and under Microsoft BASIC 2.0.

TIPS TO THE TYPIST

SOME GENERAL RULES

1. Read instructions and program headings carefully.

2. Don't let fatigue and boredom contribute to inaccuracy. If you're new to programming, type in a longer program in easy stages, SAVEing each installment as you go.

3. Assume that every character in a program listing must be copied accurately if a program is to work.

4. Watch out for potential trouble spots. About 90 percent of all typing errors occur in DATA statements.

5. Be aware that our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press RETURN or ENTER before checking to see if the program "line" you're typing really ends there.

6. To correct an error in a BASIC program line, type the line in again from the beginning and press RETURN or ENTER to replace the old line.

DEBUGGING HINTS

1. Write down any error messages you receive.

2. Look up error messages in your manual, and check the indicated lines for simple mistakes. Also check related lines, such as the DATA statements corresponding to a READ routine. Correct all the problems you can find, and SAVE a corrected copy of the program before typing RUN again.

3. LIST the program in screen-size chunks (check your manual for instructions on how to LIST parts of a program) or get a printout. Compare what you've typed in—letter by letter—to the published program. Make sure that you haven't dropped or mixed up some punctuation, switched uppercase text for lowercase, or vice versa, or miscounted the characters (and/or spaces) between a pair of quotes.

4. Mistakes in DATA statements are the single most common cause of program failures. If you can't find your error in the lines the computer specifies, check your DATA statements line by line, letter by letter, comma by comma.

5. If all else fails, turn off your computer and relax. Then try again the next day—exhausted proofreaders are careless proofreaders.

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